The STORM A Chilton Publication

Special Machine Tool Show Issue

THE NATIONAL METALWORKING WEEKLY . AUGUST 25, 1955

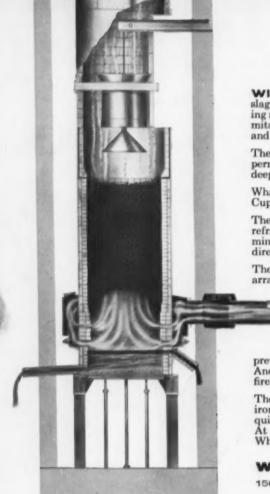
castest automatic in its range. Machine . . . most advanced automatic on the market for stock up to 1/2"! Push-button control . . . faster, easier, set-ups ... exceptional speed and turning capacity . . . outstanding accuracy ... carbide tooling where desirable. Just a few of its many unique features! Write for full details. Brown & Sharpe Mfg. Co.,



MROUGH OUR PAY-AS-YOU-DEPERCIATE MACHINE TOOL PLAN

Brown & Sharpe 185





WITH A WHITING CUPOLA you can use either basic or acid slag practice! Basic slag practice, while still somewhat new is becoming more popular because it makes possible a reduction in sulphur, permits the use of a greater percentage of steel scrap with less pig iron and more readily increases the carbon content of the metal.

The height of the tuyeres in the Whiting Cupola may be varied to permit a change from acid to basic slag operation or vice versa. Special deep well spouts are available for use with the basic slag practice.

Whatever practice you intend to use, be sure to look into Whiting Cupolas—for they are built for a lifetime of efficient service.

They are easy to erect and the design permits the use of standard refractory shapes from top to bottom. Piping costs are held to a minimum because the tangential blast entrance allows the most direct connection from blower to windbox.

The location of windbox above the tuyeres allows for easy light-up arrangements. Air for melting is distributed evenly with minimum resistance—with no air leakage in windbox. Lining and stack are protected against moisture by stack joints

A fusible safety plug is provided with a special safety tuyere. If the cupola tender does not tap quickly enough, the metal and slag flow through a channel which

prevents slag from entering other tuyeres and will warn the operator. Another safety feature is a double-cone spark arrester to reduce fire hazards.

These cupola principles result in economy and high quality molten iron. It will pay you to call in a Whiting Engineer to discuss your requirements. He has the experience to help you plan your installation. At least $90\,\%$ of the cast iron that is melted in cupolas is melted in Whiting Cupolas! Write or phone for his counsel now!

WHITING CORPORATION

that open downward.

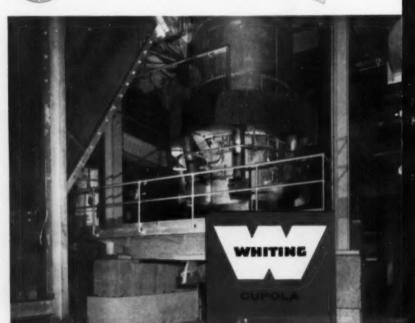
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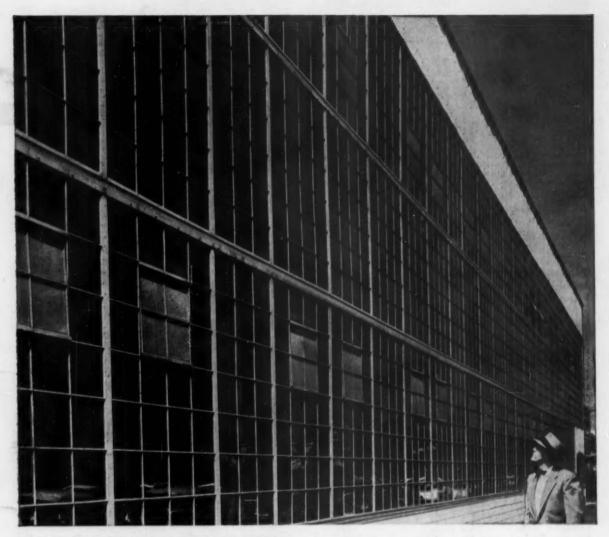
NOW!
USE
BASIC
OR
ACID
SLAG

PRACTICE!

Send for Whiting Bulletin FY-172 entitled "Whiting Cupolas." 24-pages packed with illustrations and information about the Cupola, Tuyere Design, Cupola Accessories, Whiting Hot Blast and complete statistics. Write today!







The secret of their strength... hot-rolled special sections

THESE industrial windows are framed with steel—sturdy steel sash fabricated from Bethlehem hot-rolled special sections.

By using special sections rolled to their drawings and specifications, window manufacturers are able to produce sash that has great strength, yet is light, economical and pleasing to the eye.

Whatever your product may be, we urge you to look into the many advantages of Bethlehem hot-rolled special sections. They often eliminate the need for costly machining, forming and fabricating operations. And special sections give you wide freedom of design, because rolling puts extra metal where it's needed for strength; eliminates excess metal for economy. The result is you can make a better product, and at less cost.

Other Bethlehem carbon-steel bar products include hot-rolled carbon bars in both standard sections and bar-size shapes. Also semi-finished carbon-steel products: blooms, billets and slabs. For complete information about any of these products, please contact the Bethlehem sales office nearest you.



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BETHLEHEM STEEL





DIGEST OF THE WEEK

Vol. 176, No. 8, August 25, 1955

Starred Items are digested at the right

EDITORIAL After Rapid Amortization What? **NEWS OF INDUSTRY** *International: Atoms for Peace Conference . . . 160 *Disaster: Metalworking Hard Hit by Flood 161 *Production: Steel Container Sales and Supply. . 162 Industrial Briefs 170 Personnel: Iron Age Salutes 185 Iron Age Introduces ... **NEWS ANALYSIS** Newsfront Report to Management Automotive Assembly Line West Coast Report ... 181 *Machine Tool High Spots ... 183 *SHOW FEATURES Tooling Meets Tomorrow's Needs The Outlook for Machine Tools 201 Machine Tool Show Preview 217 Production Engineering Show Preview List of Exhibitors MARKETS & PRICES The Iron Age Summary—Steel Outlook 279 Comparison of Prices REGULAR DEPARTMENTS Dear Editor Fatigue Cracks Dates to Remember INDEX OF ADVERTISERS 307

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NEWS DEVELOPMENTS

ATOMIC CONFERENCE STIRS WORLD REACTION—P. 160 Recent Geneva gathering of nuclear scientists is hailed as a history making event. Talks marked the first large-scale exchange of nuclear data between nations. They disclosed broad progress, drew predictions of startling things to come. Russians were friendly, told something of their plants and plans. Amiable spirit of sessions may ease political tension, will certainly speed nuclear development.

NEW ENGLAND FLOODS HIT METAL PLANTS — P. 161 Hard hit by swollen rivers in the wake of Hurricane Diane, New England metalworking plants are digging out from under tons of muddy slit and miscellaneous debris. In Connecticut's Naugatuck valley area, about 25 pct of entire U. S. brass mill production is estimated to be knocked out. Work on cleaning and drying machinery will take weeks to months.

STEEL CONTAINER OUTPUT SHOWS RISE — P. 162
This year's first half output of heavy and light gage
drums and pails is up 8.8 pct over the same period a
year ago. Right now, a promising high-level production
year for the industry could be seriously affected by the
current tight supply of hot and cold-rolled sheet. How
much total output will be affected is a question. All told,
the industry takes up some 1 million tons of sheet a
year—second only to the automakers.

ATLANTIC CABLE WILL LINK CONTINENTS — P. 163
Two thousand miles of copper coaxial cable with 52
amplifiers for each circuit will bridge ocean with
telephone lines. The system, which will cost \$35 million, will be in commercial operation late next year.
It is jointly owned by American Telephone & Telegraph, British Post Office, and Canadian Overseas
Telecommunications Corp.

MORE PEOPLE WILL SHARE WORLD RESOURCES—P. 177
Census figures show births outstripping deaths by a big margin. World population will reach 7 billion in 70 years. The United States will have to feed and clothe 221 million by 1975. All of which points to more careful use of reosurces, greater attention to developing power, food and other source.

MACHINE TOOL SHOW ISSUE

IN METALWORKING

MACHINE TOOL SHOW STARTS SEPT. 6 — P. 155
Show visitors will see an amazing assembly of the latest in cost cutting tools—some 2000 of them, weighing 10,000 tons. Planning the show was a back breaker.
Units had to be put where they'd fit and they had to move in on a schedule starting last June. You'll see no fancy booths but world's largest tool display.

ANALYZES MACHINE TOOL RESERVE PLANS - P. 158

This Iron Age "interview" with a high ranking member of the Defense Dept. brings you up to date on the latest government thinking on machine tool reserves, standby plants, off shore procurement, leasing of reserve tools for non-military production and the status of the present military production capacity.

CLOSE SALES WATCH WILL FOLLOW SHOW - P. 183

Builders are making a strong sales pitch for latest equipment at the Machine Tool Show. Question is: how much and how soon will the show pay off in new orders. Sales rose after the last exhibit but experts differ on the part played by the show in this rise. Builders look for a good fall season; impact of the show could make business very, very good.

TOOLING MEETS TOMORROW'S NEEDS - P. 191

Plymouth's new V-8 engine plant is one of the most modern in the auto industry. Here's a look at the many tooling innovations that were developed for maximum efficiency and production flexibility. The author also takes you for a trip behind the scenes. He discusses the plans and decisions that precede a major tooling program such as this.

THE OUTLOOK FOR MACHINE TOOLS - P. 201

Rapid technological changes and a growing population will continue to be the main forces behind an increasing demand for machine tools and other capital equipment. Two fast-spreading trends will add further impetus. They are the growth of long range planning and the expansion of consumer markets due to innovations. Pace will hold or accelerate.

BUILDING YOUR EQUIPMENT POLICY - F. 205

Machine tools don't have to be old to be old-fashioned. It's their economic usefulness that counts; not their age or appearance. Here's a down-to-earth guide to the Why, When and How of equipment replacement analysis. It shows the need for understanding, good timing, a practical formula and common sense in building a sound replacement policy.

CHOOSING GENERAL PURPOSE TOOLS - P. 211

General purpose machine tools are still the mainstays of medium production shops. But they're getting fancier all the time. Making the wisest choice from among many new models is easier if you remember that "time is money." Look for machines powered to do the fastest possible cutting with minimum vibration And consider the machine's potential for time savings in tooling setups and changes.

TOOL BUYERS RAISE THEIR SIGHTS - P. 215

Increasing business activity through 1955 and a solid outlook for 1956 have caused machine tool buyers to revise upward their early 1955 estimates. Latest survey shows an 8 pct rise in planned purchases compared with a similar poll in February.

MACHINE TOOL SHOW PREVIEW - P. 217

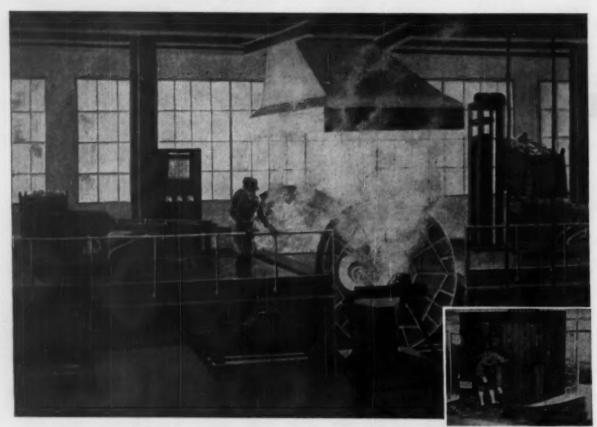
Here are pictures and descriptions of the latest in metal cutting, grinding, and forming equipment that will highlight builder's displays at the giant Show. Clip and use it as a tour guide; builder's booth numbers are listed for your convenience.

PRODUCTION ENGINEERING SHOW PREVIEW - P. 264

You'll find photos and brief descriptions of many automation aids and machine tool accessories to be featured at Chicago's Navy Pier. There are ideas galore; it's truly a display you can't afford to miss.

COMPLETE LIST OF EXHIBITORS - P. 27

Want to see something special at any of the three big shows? Here's a complete list of exhibitors and booth numbers for The Machine Tool Show, The Production Engineering Show and The Coliseum Machinery Show—all in alphabetical order for your convenience. List permits best use of your time.



BRASS MELTING THROUGH 150 YEARS

According to tradition and available records, founders of the Scovill Mfg. Co. of Waterbury, Conn., were first in the New World to cast brass bars commercially for subsequent cold rolling, at the old Abel Porter casting shop in Waterbury, Conn.

From this modest beginning has grown the huge Scovill Works employing thousands of employees and producing enormous quantities of cold-rolled brass. One of the initial steps in the process is the melting of brass in three of the largest and most powerful electric melting furnaces ever made, one of which is shown in the picture above.

In the early 1800's the man-hour rate of production with charcoal pit fires was from 5 to 10 lbs. In the early 1920's when AJAX INDUCTION FURNACES

were installed, the man-hour rate was 800 lbs. Since 1949 when the latest type AJAX furnaces were installed man-hour production has increased five fold, and is now 4,000 lbs.

These modern 1000 KW AJAX Furnaces have a holding capacity of 20,000 lbs. with an hourly melting rate of 5 to 51/2 tons.

Photos at right show a unique demonstration staged by Scovill at the Hotel Statler in Hartford of America's first practical brass casting method. Here an operator in authentic brass caster's clothes of the period illustrated the casting of metal melted by the old bellows-blown pit fire used in the early 1800's. The tools were loaned by the Mattatuck Historical Society of Waterbury.

Skimming the pot prior to pouring into tiny 1 lb. capacity band-and-wedge molds.



Pouring from pot into molds.



Opening molds after pouring metal into them.

AJAX



AJAX ENGINEERING CORP., TRENTON 7, N. J.

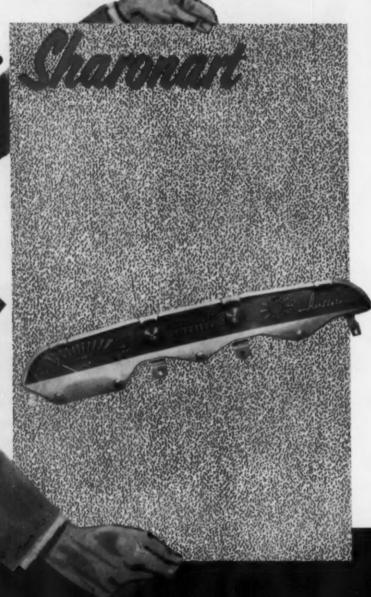
INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ast Retiring High Frequency Induction Furnace
AJAX ELECTRIC CO., he has fullyon Electric Sit Buth Furnace
AJAX ELECTRIC FURNACE CORP., has Write Inductive Furnace to Marine

Flexible, lightweight ATLAS Slings mean job-after-job safety...



TO CHANGE THE Style CHANGE THE STEEL



Automotive designers are finding Sharonart — the steel with a rolled in design — provides a whole new field of design possibilities. It permits restyling without expensive die change. It provides the widest possible flexibility in working out new models. It is unusually adaptable to two-tone spray painting. It adds a richness to your product, and, because it doesn't mark or show scratches, it brings extra utility to those parts that must withstand abuse.

If you are not already familiar with the many advantages of designing with Sharonart you will want a copy of the new bulletin that thoroughly explains this remarkable steel. It's free for the asking Contact the Sharon representative in your area or write direct

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Indexed in the Industrial Arts Index and the Engineering Index.



Editorial:

After Rapid Amortization What?

• IN A GUNS AND BUTTER ECONOMY we have to assume that upon sudden notice all butter must become guns. We have learned that in a controlled gun economy butter picks up. That's the position we are in today.

Demand for everything today is taxing current production capacity. Higher wages and bigger spending are causing tight spots in our materials picture. There is sure to be an upward movement in the price level. That means more controlled inflation.

One way to support controlled inflation is to have new machinery, adequate materials and a goodly supply of working capital. One sure way to have all this and at the same time meet high wage and tax demands is by rapid amortization.

Had we not had quick writeoffs in the past several years we would not now be in such a strong defense position. Possibly the Big Four conference might have turned out differently or might not have been held at all without rapid amortization.

We use much of our machinery and industry interchangeably for both guns and butter. It would take a Solomon to correctly mark the dividing line. But a strong economy is just as important to guns as it is to butter. And it is just as important as a deterrent to Communism.

Our government is cutting down on rapid amortization. While it will not be cut out entirely, Secretary Humphrey hopes to reduce the total considerably. He is attempting this in order to get a balanced budget as soon as possible; that was a campaign pledge in the last Presidential election. But he may be quietly using amortization cutbacks as an inflation deterrent.

We must assume that there will be a damper put on rapid amortization for a while at least. But if that form of fast writeoff goes out the window or is cut drastically, the Administration would do well to get to work quickly on a normal everyday amortization law for industry.

These are times when mounting costs must be held at bay by the latest and best in machinery and techniques. Only in that way can we have our cake and eat it. Only in that way we can afford peace and freedom.

Industry needs help to do this.

Tom Campbell

See the NEW Motch & Merryweather MILL-M-MATIC PRODUCTION MILL at ...





MECHANICAL TABLE FEED

AUTOMATIC TABLE CYCLES

RIGID OVER-ARM

Capyrighted 1955 by The Metch & Merryweather Machinery Co.

You owe it to your production program to get all the details on this new heavy duty series of bed-type Mill-M-Matics. They utilize 25 horsepower through the spindle drive. Electrically controlled movements are mechanical to insure maximum rigidity and effective production with accuracy. The new Mill-M-Matic is now offered in a full range of heavy duty sizes by Motch & Merryweather, foremost builder of traveling head milling machines.

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MACHINERY MANUFACTURING DIVISION

CLEVELAND 13, OHIO

Builders also of Circular Sawing Equipment, Vertical Turning, Automatic and Special Machines



Are We Being Sucked In?

Sir:

How really glad I am to read your editorial: "Are We Being Sucked In?"

All your friends over here are really afraid to see weekly in magazines like *Time* or *Life* and even technical magazines, like *Machinery*, how openly you discuss of your actual process and most upto-date methods concerning the new nuclear energy.

We believe, as one of my French friends told me this morning, that it is not only very important to conceal the things we know, but also most important to conceal the things we do not know.

This has been the Russian policy for the last thirty years.

It seems that as long as the same policy as yours is not adopted by Russia, you are indeed "sucked in."

And the trouble is, for us, that we are sucked in at the same time.

I only wanted to tell you how glad I am to see that some Americans are still seeing things as they should be seen and not as they wish them to be. Pierre Dufour, Ingenieur Des Arts et Metiers, 11, Rue Aspirant Dargent, Levallois (Seine), France.

Pressure Gage

Sir:

An interesting article concerning an extra sensitive pressure gage, developed by Ryan Aeronautical Co., appeared on pp. 130-132 of the July 14 issue.

We would like to have your permission to reprint this article, with credit mention to THE IRON AGE. Our use would be in a confidential bulletin called the Standards News Letter published for circulation exclusively to employees of the du Pont Co. D. F. Hollingsworth, Acting Principal Standards Engineer, E. I. du Pont de Nemours & Co., Wilmington 98, Del.

letters from readers

Vacuum Metallizing

Sir:

We noticed an item on page 17 of your June 30, 1955 issue on wider use of vacuum metallizing and are wondering where we might obtain more details. R. K. Howie, General Manager, The Grigoleit Company, 740 E. North Street, Decatur, Ill.

Details may be obtained from J. G. Seiter, F. J. Stokes Machine Co., Tabor Road & E. Adams Avenue, Philadelphia.— Ed.

Alkaline Solutions

Sir:

Please send us ten reprints of "Alkaline Solutions: What to Use for Effective Cleaning" by J. B. Mohler which appeared in the July 28, 1955 issue of THE IRON AGE. W. T. West, Technical Service Dept., Pennsylvania Salt Manufacturing Co., Three Penn Center Plaza, Philadelphia.

"100 Years"

Sir:

The magazine is certainly one that will be treasured in corporate libraries for many years.

It has been a pleasure for our company to watch the growth of both The Iron Age and ourselves, in a spirit of growing together. You are to be complimented on a most noble achievement, and with it goes our best wishes for the second 100th. D. C. Verson, President, Verson Allsteel Press Co., 1355 East Ninety Third Street, Chicago 19, Ill.

I have only glanced through it but I am taking it home so that I can peruse it at leisure and enjoy every page of it. It shows that a great deal of valuable time and thought has been put into it. C. W. Briggs, Technical & Research Director, Steel Founders' Society of America, 920 Midland Building, Cleveland.

TO MAKE IT SELL FASTER ...



consider a ball

Again and again, the buying public has demonstrated—with cash on the line—that it has a strong and ready preference for any product that features one or more balls in its mechanism. Ball-point pens, for example...

So doesn't it seem like just good business to design a product with the "popular appeal" of a ball to help it sell faster?

A Universal Ball?
A Universal Ball so amazingly accurate (better than ten-milionths of an inch) that it opens up new and limitless possibilities of application for designers and manufacturers in every field ... A ball so tiny you can scarcely see it (comes in many sizes you can see, too) ... A ball that runs one of the toughest quality control "courses" you'll find anywhere.

We like to help people sell products as fast as they can make 'em. May we help you?



Universal Ball co.



WILLOW GROVE

announcing



- economy for short or long runs fully automatic tape control
 - set-up time cut up to 600% no jigs, fixtures high accuracy

Now you can get full-time production from expensive vertical drilling equipment! This fully automatic, tape-controlled positioning table — the ARTER

JIGMATIC — cuts set-up time to a tiny fraction of that required by any other positioning method. Full automatic positioning at the touch of a button, for any number of hole locations. No jigs, fixtures — no stops to set — just high accuracy, fast, economical production. For use with standard radial drills or other suitable spindles.



See this Show stopper at Booth 1308.

Yours! Complete information on the ARTER JIGMATIC automatic, tape-controlled positioning table.

Write for Bulletin I 55a.



grinding machine company

WORCESTER MASS.

fatigue cracks

by William M. Coffey

New Man (Temp.)

It has long been the policy of this column to fill in with distinguished guest columnists during the summer months—much as the TV people have a big run on "specially selected" (though rather old) films. Like the makers of the old films, your guest columnist for this week prefers to remain anonymous. Unfortunately "Caleb Flerk's Own Story," which must have left many readers up in the air, can't be continued until your regular columnist returns as no one has figured out how the thing comes out.

Safety Poster

Ever anxious to contribute our mite to safety we give you below a poster—a little small but to the point. It's a sketch of a careless punch press operator ordering four beers:



Atoms for Peace

In the news section of this week's issue you'll see a brief report on the Geneva conference on peaceful uses of atomic energy. This is, you will if the editorial staff ever gets through the mountain of copy reporting on the affair. Thought you'd be interested in one item that reads: IN 1ST PGH 1ST LEAD

ATOMS GENEVA PLEASE ELIMINATE FINAL QUOTATION MARKS AFTER HYDROGEN BOMB.

Comment: One of those things that speaks for itself with exclamation points.

Need Bound Volumes?

Because we are microfilming back issues we have on hand bound volumes from 1928 through 1945 to give away. You may have the whole collection, on a first-come first-served basis, for the cost of the collect freight.

Answers

The two numbers sought in our August 4th puzzler are 300 and 729. The cube of 300 equals 1,000,000 times the square root of 729. A lot of people had it right: G. M. Bliss, U. S. Steel; R. W. Alexander, Hackensack Cable; L. B. Kramer, Whetherill Engineering; D. H. Smith, Durex Hardware Mfg.; R. A. Badt, Junior Steel Co., and J. Ockin, Specialty Mfg. Co.

Puzzlers

We figger the farmer had 24 chickens in his flock (July 21 puzzler). Winners: A. F. Kaupe: Donald F. Stoneburner, Oak Ridge National Laboratory; L. Euclid King, Automatic Machine Products Co., Attleboro, Mass.; W. A. Sawdy, MacInnes Steel Sales Co.; Robert K. Orndoff, Vanadium Corp. of America; J. F. Robinson. U. S. Steel; Don Hartman, Solar Steel Corp.; Jim Mull (and we're sorry we can't include Marilyn who as Jim tells us has left him for another department for a mundane thing like more money), The North American Manufacturing Co.; A. L. Chilman, Columbia-Geneva Steel; C. E. Rick, E. I. duPont; D. M. Loving, Lone Star Steel Co.; Charlsie, who did it all alone; Francis G. Forquer, Daystrom Instrument; and Roy A. Badt, Junior Steel Co.



From the makers of Luster-On, the original bright conversion coating for zinc and cadmium comes Luster-On Aluminum Sealer. This new sealer produces a chromate film on aluminum that provides excellent corrosion protection and can serve as a paint base.

Now government approved, Luster-On Aluminum Sealer meets Spec. MIL-C-5541.

Specify Luster-On Aluminum Sealer for:

- Replacing anodizing where hardness is not a prime factor . . . eliminating expensive equipment.
- Salt spray resistance to 600 hours.
- Easy application in one dip at room temperature . . . clear to yellow-brown colors from the same bath.
- Excellent adherence . . . does not leach easily.
- Extreme economy for user.

Send samples today for free laboratory treatment. See superior results with your own eyes.



CORPORATION

79 WALTHAM AVENUE, SPRINGFIELD 9, MASS

Air Motor

Takes "Backache" Out of Molding Job...

SAVES \$3.10 a day...

A large producer of aluminum parts had a number of strenuous jobs. One involved manually moving a four foot rack and pinion handle through a 200° arc to raise and lower a collapsible core in a book mold.

AlRengineering was put to work. An Ingersoll-Rand Size SSSO Air Motor was installed to operate the pinion. Production jumped from 180 to 220 pieces per day . . . workers no longer complained . . . and savings amounted to \$3.10 a day. As a result, two more Air Motors were installed, with similar savings.

You may be the man who brings production or maintenance savings into your plant. A look at I-R's confidential manual of reports on "Albengineering at work" could point the way. Write on your company letterhead, and we'll arrange for you to see it.



Ingersoll-Rand 11 Broadway, New York 4, N.

AlRengineering Manual Don't miss over 100 interesting case history

applications of AIRengineering in this confidential manual



dates to remember

SEPTEMBER

INTERNATIONAL BRIQUETTING ASSN.—Annual conference, September 1-3, Stanley Hotel, Estes Park, Colo. Association headquarters are at the University of Wyoming, Laramie.

AMERICAN MACHINE TOOL DISTRIB-UTORS ASSN.—Annual meeting, Sept. 5-6, The Blackstone, Chicago. Association headquarters are at 1900 Arch St., Philadelphia.

INSTRUMENT SOCIETY OF AMERICA
—Annual meeting, September 12-16,
Shrine Auditorium, Los Angeles. Society headquarters are at 1319 Allegheny
Avenue, Pittsburgh.

PACKAGING MACHINERY MANUFAC-TURERS INSTITUTE — Annual meeting, Sept. 15-18, The Homestead, Hot Springs, Va. Institute headquarters are at 342 Madison Avenue, New York.

EXPOSITIONS

MACHINE TOOL SHOW—Presented by National Machine Tool Builders Assn., International Amphitheatre, Chicago, September 6-17, inclusive. This is the first industry-wide showing since 1947 of advances in machine tools.

SOCIETY OF INDUSTRIAL PACKAG-ING & MATERIALS HANDLING EN-GINEERS—Annual meeting, September 19-22, Kings Armory. New York. Society headquarters are at 111 West Jackson Blvd., Chicago.

OCTOBER

AMERICAN INSTITUTE OF ELECTRI-CAL ENGINEERS—Fall general meeting, October 11-16, Morrison Hotel, Chicago. Institute headquarters are at 36 W. 46th St., New York City.

AMERICAN CHEMICAL SOCIETY—National Chemical Exposition, October 12-15, Chicago Coliseum, Chicago. Society headquarters are at 86 E. Randolph St., Chicago.

AMERICAN COKE & COAL CHEMICALS INSTITUTE—Annual meeting, October 17-18, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters are at 711 Fourteenth St., N. W., Washington, D. C.

AMERICAN GAS ASSN.—Annual meeting, October 17-19, Los Angeles, Association headquarters are at 420 Lexington Ave., New York City.

AMERICAN SOCIETY FOR METALS— The Tenth Metallographic Exhibit will be held at the National Metal Congress and Exposition in Philadelphia, October 17-21. Headquarters are at 7301 Euclid Ave., Cleveland.

AMERICAN WELDING SOCIETY—Fall technical meeting, October 17-21, Philadelphia. Society headquarters are at 33 West 39 St., New York City.



A.S.M.E. U60-U69 Quefiled Welders . S.F.I. - A.S.M.E. Approved

lerwriters Label & Inspection Service . X-Ray Facilities . Navy Approve

EVERDUR

ALLOYS

Matienal Board Approved . Hartford Steam Boiler Inte

STAINLESS STEEL

STEEL

AUTOMATION in 91 station, 182 operation, in-line transfer machine features four segments which can operate independently or as a unit to assure continuous production of automotive automatic transmission cases at 100 cases an hour at 80% efficiency

BOOTH TEER

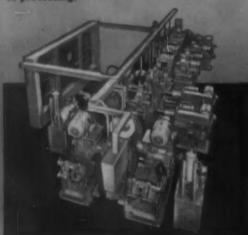


SNYDER

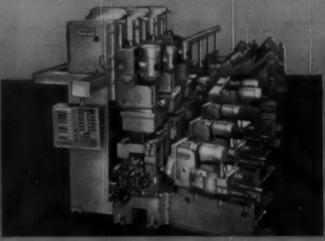
TOOL & ENGINEERING COMPANY
3400 E. LAFAYETTE, DETROIT 7, MICHIGAN

30 Years of Successful Cooperation with Leading American Industries

SEGMENT 1: 40 feet long, 19 stations, 10 spindles. Part manually loaded, both ends face milled, counterbored, three diameters rough and finish bored and faced, two pads side milled, pump pad face milled, clearance slot milled. Part tilted 90 degrees in processing.



SEGMENT 2: 47 feet long, 31 stations, 91 spindles. In top face, end and at angular locations inside, 51 holes are drilled, countersunk, semi-finish and finish reamed, spot-faced, tapped. Part is tilted 90 degrees and retated.







The man who needs a new machine tool and doesn't buy it - OST is paying for it anyway...

production

Because costs are set largely in labor and burden, lost production is reflected directly in high unit cost. Old equipment is not the only cause. Failure to utilize the latest processing techniques may be keeping you from increasing production and lowering unit cost.

For example, consider the low-velocity, controlledabrading Microhoning process which combines stock removal, geometric accuracy, size control and surface finish to increase production and precision. Inherent characteristics of Microhoning eliminate such downtime factors as tool sharpening, fixture and machine aligning.

The difference between your current output and the production possible with Microhoning will, in a short time, cover the cost of new Microhoning equipment. And until you do utilize the most efficient processing techniques, you are paying for new machine tools you don't have.

PART:

PROBLEM:

High unit cost; how to increase production without increasing labor or burden cost.

SOLUTION:

Microhoning—simplified processing of wristpin bore (eliminating 3 operations); gross production increased to 600 bores per hour, within all speci-

*MICROHONING = STOCK REMOVAL + GEOMETRY + SIZE CONTROL + SURFACE FINISH

ICROMATIC HONE CORPORATION

MICRO-PRECISION DIVISION - 2205 Lee Street, Evention, M



SOUTHERN PORCELAIN is proud of theirs . . .

Down in Dallas (Texas, where they make them, that is) they're real proud, Pardner! It's the combination of greater sales appeal and lower production costs that's pleasing them so!

Southern Porcelain's mighty pleased with Sciaky resistance welding, too! That's what improved their methods and cut their costs and increased their product sales appeal!

Are you proud of your "kitchen sink"!

You can be because, the chances are, you can simplify your production methods and lower your production costs with Sciaky resistance welding—just like Southern Porcelain did!

SEIAKY

Largest Manufacturers of Electric Resistance Welding Machines in the World

GO AHEAD

tain the page and see the facts on Southern Porcelain's resistance welding operation



High production Sciaky resistance welding joins

TEN THOUSAND UNITS WITH LESS THAN 1% SCRAP FACTOR

Other methods of fabricating Double-Sinks FAIL!

How old is "antique"?
... with resistance welders
it may be only five years
because of recent Sciaky
technical achievement.

Production limitations and high operating cost make these antiques "expensive." You can't be competitive if your product won't let you compete!

Within ten days of delivery, one Sciaky mash welder with an inexperienced operator joined 10,000 sink units with less than 1% scrap factor for Southern Porcelain in Dallas, Texas. Not only quality and production beyond expectation, but metal finishing operations were minimized.

For almost a year Southern Porcelain unsuccessfully tried every conceivable method to join two 14 gauge Armoo deep drawn steel sink units to fabricate a double-sink. Reject rates ran high because porcelain finishing demanded a strong, smooth, non-porous joint.

The relatively simple solution to this problem is actually the product of Sciaky's basic philosophy in design—resistance welding to do more useful work at lowest operating cost with maximum reliability.

You can read all the details of this interesting application free—send your name and title on company letterhead for your copy of "Resistance Welding At Work", Vol. 4—#6.

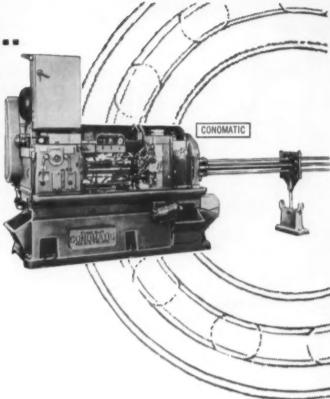
Largest Manufacturers of Electric Resistance Welding Machines in the World

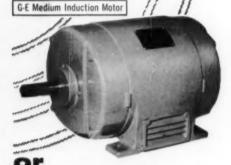


Sciaky Bros., Inc., 4910 West 67th Street, Chicago 38, III., Portsmouth 7-5600

to feed a tool...

Automatic feed transmissions on newest type Conomatic Six Spindle Bar Machines have to deliver a powerful, steady tool drive under heavy loads for precision carbide machining. Feed shaft bearings must be rugged—precise. They're Federal Ball Bearings.





quiet a motor...

The smooth hum of today's precision-built motors whispers the efficiency of every part. Here, too, Federal Ball Bearings quietly perform their continuous, anti-friction assignment—whatever the size—whatever the type.

so much of industry *turns* on **FEDERAL** ball bearings

Machine tools—motors—or moving vans! At plant, home, machine shop! On the highway, on the farm—where there's anti-friction work to be done, you'll find Federal Ball Bearings quietly and efficiently on the job. Hundreds of types—12,000 sizes—produced by this 50-year-old manufacturer of ball bearings...exclusively. When Federal Ball Bearings are a part of so many things you use, shouldn't they be a part of the things you make?

Just off the presses! 175 pages of ball bearing and engineering data—FEDERAL'S NEW CATALOG! Just drop us a line and we'll speed you your copy.

THE FEDERAL BEARINGS CO., INC. . POUGHKEEPSIE, N. Y.



Federal BALL BEARINGS

One of America's Largest Ball Bearing Manufacturers

Compare

...AND YOU'LL SEE WHY

Increased Production Costs Less with DANLY PRESSES

Feature for feature, you can compare Danly presses with all others and see why far-sighted, progressive management prefers Danly. Such point-by-point, feature-for-feature comparison is exactly what one of the world's largest builders of autos and trucks made. Result? They bought and installed Danly Presses in their new production lines.

Now, after more than two years of continuous, high-speed production, these presses have "proved out" with a truly outstanding performance record. First, they have been charged with only four man days for other than routine maintenance. During this same period, shift production averages have been consistently higher for long, continuous runs. The cost advantage and over-all output gain is obvious.

Other indirect benefits were noted, too. *Installation* of all the presses was completed without overhaul or major adjustment. Also, the dependability of the Danly Presses made it unnecessary to maintain costly stocks of press spare parts — an important cost saving in itself.

Danly Presses will "prove out" in your plant the same way. Use the check list shown now . . . make your own comparison and see why Danly Presses will give you increased production at lower cost.

It costs less to run a DANLY PRESS

DANLY MACHINE SPECIALTIES, INC. 2100 South Laramie Avenue - Chicago 50, Illinois



USE THIS CHECK LIST

... Compare Danly Presses, feature for feature, with any other press on the market. See Danly Presses in action at the Machine Tool Show. COMPARE



INSTALLATION COSTS

PEATURE Danly presses are delivered already "run-in" tested. Faster installation is assured by assembly and operation in the Danly plant.

DRIVE

Danly's cool-running clutch lasts up to 7 times longer. Herringbone type gears and anti-friction bearings on high speed shafts wear longer.



CONSTRUCTION

Danly presses are made entirely of heavy stress-relieved steel weldments. Extra heavy internal ribbing decreases



LUBRICATION

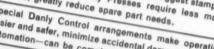
Danly features completely automatic oil lubrication. When any vital area is not being sufficiently lubricated, safety switch stops press.

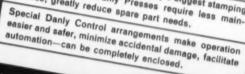


MAINTENANCE

CONTROLS

Performance records in the country's biggest stamping shops prove that Danly Presses require less maintenance, greatly reduce spare part needs.





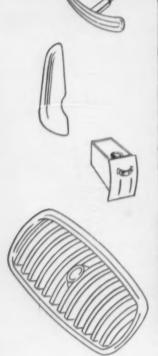


Big maintenance saving factors are the Danly Cool Running Clutch designed for longer wear, easier accessibility and completely automatic oil lubrication.

Extra long gibbing to maintain precision slide alignment and greater over-all rigidity of construction help assure uninterrupted production for long runs.

> Pre-assembly and testing before shipment, especially of control circuits and wiring, saves valuable installation time.

Another field report on "TRICLENE": D





BUMPER GUARDS being loaded into roller conveyor degreaser at Grand Rapids Metalcraft by worker Ben Kolenda.



THOROUGHLY CLEANED with TRICLENE D, bright bumper guards are removed at end of degreaser by James Holliday.

"TRICLENE" D makes vapor degreasing easier than ever ... now we can put through a larger volume of work,"

Says C. Nesselroad, Mgr., Grand Rapids Metalcraft, Division F. L. Jacobs Co., Grand Rapids, Mich.

"We operate six degreasers—two manual and four conveyorized," continues Mr. Nesselroad, "and since we turn out as many as 150,000 parts per day, we've found we just can't afford to have trouble."

That's why Grand Rapids Metalcraft uses TRICLENE D trichlorethylene. With this rugged solvent, they've had consistently thorough, trouble-free degreasing of the automotive stampings they manufacture—bumper guards, brackets, ash trays and grill parts. And with TRICLENE D, their volume of work handled has shown an *increase*... and maintenance costs have *decreased*. Furthermore, Mr. Nesselroad concludes, "We've never found a degreasing job that TRICLENE D trichlorethylene couldn't do!"

Locked-in stabilizers give TRICLENE D unsurpassed resistance to all major causes of solvent deterioration—heat, light, air, acids and aluminum chloride—yet this rugged solvent contains nothing to harm even delicately machined metal surfaces. TRICLENE D retains its original high purity longer . . . continues to give brighter cleaning of any metal job after job, distillation after distillation. And remember, it costs no more!

FOR MORE INFORMATION on TRICLENE D and how it can bring a new standard of efficiency to your vapor degreasing operation, write our nearest District Office. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.



BETTER THINGS FOR BETTER LIVING

TRICLENE® D

TRICHLORETHYLENE

Greater Productivity

Sept. 6-17

See Many of these Monarch Lathes in Action

TOOLMAKER'S LATHES in a complete range of sizes

ENGINE LATHES

THE MONA MATICS for high production metal turning

THE HYDRA-SLIDE for high production thucking

for high production thucking and fixture work

THE SPEEDI-MATIC
a fast, precision hand screw machine
MONARCH-KELLER TURNING MACHINE

THE MONARCH MOTOR-TRACE

THE MONARCH AIR-GAGE TRACER

THE MONARCH ROLL TURNING LATHES

THE MONARCH 60" RIGHT ANGLE LATHE

THE SHAPEMASTER ENGRAVER

PLUS - the New Monarchs --

at the Machine Tool Show

Make your primary target the finest metal turning equipment ever produced—at the Monarch exhibit just inside the main entrance, first floor. See for yourself the great new strides Monarch has made to give you radically new standards of productivity.

See the new Monarch Series 90 Dyna-Shift Lathes in action—the Series 62 Preselector Dyna-Shift Lathes—the Hydra-Slide (for high production chucking and fixture work)—the fabulous Series EE Model 1000, with features making it the most versatile lathe of its capacity on the market. PLUS an array of completely new cost-cutting lathes to be presented for the first time at the show,

Plan to give us lots of time at Booth 920—for better business' sake! (It's a handy place to meet friends, too.) See you in Chicago!... The Monarch Machine Tool Company, Sidney, Ohio.



GARDNER double spindle



grinder

DNER

New 2H30 engineered for higher production greater precision

- NEW Rigid Spindle Design
- NEW Massive Bed Construction
- NEW Precision Feed of Discs
- NEW Accurate Dressing Mechanism
- NEW Convenience of Setup and Operation

grinds TWO parallel surfaces in ONE operation



In operation at Booth 1115

GARDNER

precision disc grinders
BELOIT, WISCONSIN

HE TREN

SITUATION: Growing sales were taxing production capacity of tool mfr's. forge shop. Had four belt-driven board drop hammers. SOLUTION: Four Ceco-Drops now in operation -have been giving excellent service. Production is up maintenance is down. "3 hours charged against Ceco-Drops in 42 days" ._"One Ceco-Drop ran 108 hrs. (21 days) without maintenance or die work."

COLUMBUS, O.

SITUATION: Job shop with 5 Board Drop Hammers finds equipment obsoletecannot compete with lower prices and higher production of other more modern shops.

SOLUTION: Initiated 10 year program of modernization to include 15 Ceco-Drops. Three Ceco-Drops already installed to replace board drop hammers.

SITUATION: Large Auto Co. with 16 Board Drop Hammers—(7 of them Chambersburg "J's")—ranging in age from 7 to 30 Lowered production rates and mounting maintenance costs. SOLUTION: Started modernization in 1953. Converted* four "J's" with Ceco-Drop upper works. Cost and down time reduced -production up-operators like them. Other "J's" to be converted". Drops will replace older board hammers. *Saves cost of anvil and foundation!

CHICOPEE, MASS.

SITUATION: The managers of one of the East's largest forge shops saw Ceco-Drops in operation in another plant. Decided on this type of hammer for their shop. SOLUTION: Promptly ordered a 2,000 lb. Ceco-Drop and a 2,500 lb. Ceco-Drop. After a year's service their record was so good that two more 2,000 lb. Ceco-Drops were ordered. These latter

ALLENTOWN, PA. SITUATION: Tool works had the problem of keeping 23 "old dog" board drop hammers operating profitably. Had but one recent model "J" Chambersburg Board Drop.

SOLUTION: Management launched a modernization program calling for nine Ceco-Drops capable of producing a yearly tonnage in excess of the 23 old board drop hammers. Four of the Ceco-Drops are now in operation, shop layout has been revised. Efficiency and production methods have been improved.

CHAMBERSBURG

CHAMBERSBURG

O-DROPS

CHAMBERSBURG

ceco

SITUATION: One of largest manufacturers of hand tools is planning a new shop. Decided to have modern Gravity Drop Hammers. SOLUTION: Selected Ceco-Drops, and on a programmed basis is replacing board drop hammers with Ceco-To date, two 2,000 lb. Ceco-Drops and one 2,500 lb. Ceco-Drop are in operation-"Doing fine".

... and remember the Lansing Story?

LANSING, MICH.

Lansing, Mich. is unique among industrial cities in the concentration of drop forging activity in its many factories. It may well claim the title of "Drop Forging Capital of the World". In Lansing are six great forging shops covering 14 acres of land, with a working area of 985,579 sq. ft. All these great forging shops are using Chambersburg Ceco-Drops.

Forge Shop No. 1-installed the first Ceco-Drop in 1947—now forging connecting rods. Forge Shop No. 2—has installed 5 Ceco-Drops since 1950-making automotive forgings. Forge Shop No. 3-bought 4 Ceco-Drops since 1948—Commercial and automotive forgings. Forge Shop No. 4-bought seven Ceco-Drops in the last six years.

Forge Shop No. 5-Purchased 3 Ceco-Drops in 2 years.

Forge Shop No. 6-One of largest in world. Installed 11 Ceco-Drops since 1951

The gravity drop hammer with short stroke control

GINEERING

PENNSYLVANIA

See the Landis designs that establish

NEW Plain Grinders

NEW Universal Grinders

NEW Centerless Grinders

NEW Automation Ideas

NEW Tooling and Gaging Methods

new precision cylindrical grinders and automation

THE
MACHINE TOOL
SHOW
CHICAGO, ILL.

Landis Exhibit

New Annex Building
BOOTH 1117

LANDIS

precision grinders



Exhibit No. 1414

Bliss unveils four new lines of metal working presses

Many innovations in auxiliary equipment to be revealed for the first time

Visitions to the Machine Tool Show in Chicago will be able to witness operation of newly-designed inclinable, straightside, knuckle joint and high production presses—each representative of complete new press lines by Bliss.

In addition to the four new press lines, Bliss will also exhibit such important new developments in auxiliary equipment as its new Automation Control Switch, a new combination air friction clutch and brake, new feed mechanisms, and a host of other up-to-the-moment designs.

What promises to be an outstanding attraction of the Bliss exhibit, however, will be its premiere showing of four new color and sound movies on the subjects of press maintenance, automotive and appliance industry uses of Bliss-designed transfer feed presses, and on the Bliss-Crary Tonnage Limitor—a new and unusual "overload" device.

For those who intend to visit the Show, the contents of the Bliss exhibit are briefly described here with the hope that it will help them decide what they would particularly like to see, and thus help them make the most of their limited time. For those unable to attend, full particulars on all described here are available on request. New line of enclosed inclinables with air friction clutches . . . A complete new line, ranging from 75 to 200 tons, will be represented at the Show by a 75-ton model. These are extra-heavy presses: frames are totally-enclosed and they have box-type crowns. All electrical, air and hibrication controls are housed within flush-fitted panels in the frame. Other features include: air friction clutches, motorized slide adjustments and inclining mechanisms, automatic return oil lubrication, bronze liners in the slide, heavy wrist-type connections, and extra-long gibbing. All die space dimensions and controls conform to IIC standards.

Streamlined, enclosed coining press has new wedge-type adjustment . . . Bliss' new line of coining presses will be represented at the Show by a 400-ton model which will be set up to strike souvenir Bliss medallions. Most outstanding feature of the press is its new motorized wedge-type adjustment which eliminates the need for a separate top lock device and compression springs. The new press is streamlined in appearance, and its controls are neatly housed in semi-flush panels. Two independent lubrication systems are now utilized in Bliss coining presses—one to circulate cascade type lubrication to the knuckles and the other for remainder of the press bearings.

new ideas highlighted in -

PREMIERE SHOWING OF FOUR MOVIES FOR PRESS USERS

These movies will be run in the Bliss exhibit on an around-the-clock basis. A movie "time-clock" will tell you when the one you want to see will begin. After the Show, all movies will be available upon request for showing to your own personnel.

Power Press Maintenance . . . The picture was developed for instruction of personnel responsible for the upkeep of presses. It shows correct procedures for set-up of new Bliss straightside and inclinable presses . . . describes proper lubrication, inspection and maintenance methods; tells how to check and adjust slide alignment, how to adjust ball joints . . . bearing clearances . . . clutches . . . and also describes free counsel available through Bliss' new Preventive Maintenance Program.

Bliss' 1000th transfer feed press... Viewers see hew this 250-ton transfer feed press performs 11 separate operations on 5" steel blanks and produces finished auto starter brush end plates — all automatically. The dial feed, the dies required in each of the 11 stations, and the electrical interlocks that protect the press

against misfeeds are all carefully explained.

Transfer feed presses in the appliance industry... Shows how a large appliance manufacturer uses a 700-ton Bliss transfer feed press to turn out refrigerator shelves and crisper pans from coil stock. Shows every step from the coil through the series of dies to the finished pans. The transfer feed mechanism alone makes it well worth the watching.

The Bliss-Crary tonnage Limitor...This movie explains a new device designed to protect presses from overloads at every point of the stroke. It reveals that, unlike earlier devices, the Limitor adjusts itself automatically to changing press capacity characteristics at different parts of the press cycle. How it's done is explained in the film in detail.

High production press has new feed, new lube system . . . A new Bliss 60-ton H-P press, capable of making more than 450 stampings per minute, represents the new line at the Show. The feeds have been redesigned and now incorporate a new rack and pinion feed drive, an anti-friction overunning feed clutch, and a newly-designed scrap shear. Another change has been in the press legs. In its left leg have been housed its air controls, and in the right is the "heart" of a completely new return oil lubrication system — a large oil reservoir, filters and pump. Controls have been removed from the press and mounted instead on a pedestal base.

"Packaged" straightside presses: controls, piping and wiring part of the package . . . The 250-ton straightside two-point press exhibited at the show, "baby" of the line, is typical of six new lines of "packaged" presses designed by E. W. Bliss Company to aid the stamping industry in its swing towards automated production. Presses in the line, two of which are "under-drives", embody JIC specifications; are shipped

ready to be installed. About all that needs to be done is plug in air and electrical lines. Putting all pipes, wires and controls in uprights leaves clean, uncluttered exterior, and speeds maintenance. Other features include automatic recirculating oil systems, motorized plunger and blankholder adjustments, and high speed air or electric clutches—and Bliss' new Automation Control Switch for doper, kickers, lifters, Iron Hands and the like.

In addition . . . Bliss will take the wraps off its new Automation Switch, a new electro-mechanical nine-station rotary limit switch whose major advantage is the fact that despite its simplicity of adjustment and operation, it is accurate within less than one degree.

Also shown will be the details of Bliss' new crankshaft mounted combination air friction clutch and brake . . . new developments in die sets and die springs . . . new feeds and feed components . . . and a host of other developments, many of which may be of immediate and pressing interest to you. You're cordially invited to drop by the Bliss Exhibit, No. 1414, and see the latest developments in the pressed metal industry.



is more than a name...it's a guarantee!

E. W. BLISS COMPANY, Canton, Ohio PRESSES, ROLLING MILLS, SPECIAL MACHINERY





STANDARD OIL COMPANY

(Indiana)

Tool Room Superintendent Max Chase (left) and Production Engineer Peter Van Dyke (right) with Standard lubrication specialist R. T. Cleland inspect frame of extruded aluminum. Bob Cleland, a graduate of Michigan State with a B.S. in Mechanical Engineering and of Standard's Sales Engineering School, has the background to provide customers with competent technical service on their lubrication problems. This training and experience, customers have found, pay off for them.

STANOIL Industrial Oil does heavy chores for Light Metals Corporation

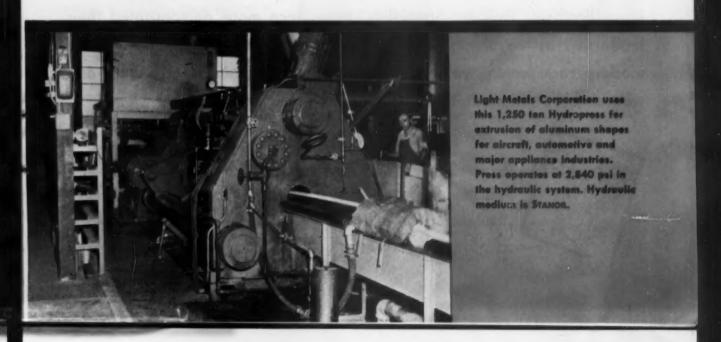
Three years ago Light Metals Corporation, Grand Rapids, put their 1,250 ton Hydropress into operation. The initial fill for the hydraulic system was Stanoil Industrial Oil. The press has operated continuously since its start up. There is no evidence of deposits or varnish anywhere in the hydraulic system. Light Metals Corporation looks forward to many more years of such trouble-free operation.

Why was Stanoil ordered by Light Metals for their Hydropress? The answer is found in the service Stanoil has given in other equipment. Back in 1948 when a Watson-Stillman extrusion press went into operation for Light Metals, Stanoil was chosen as the hydraulic oil. As with the Hydropress, Stanoil has a perfect per-

formance record. The Watson-Stillman press has operated seven years without a shutdown because of hydraulic fluid failure.

This kind of service from a hydraulic oil means Light Metals Corporation can turn out extruded aluminum shapes for the aircraft, automotive and major appliance industries with high performance and low maintenance factors that mean bigger profits. Reason enough for relying on Stanoil.

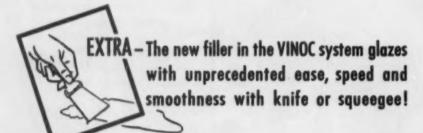
STANOIL Industrial Oil can perform for you just as it is doing for Light Metals Corporation. In the Midwest a lubrication specialist from your nearby Standard Oil office will explain how. Call him. Or contact, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



LOWE Brothers
the name for
LEADERSHIP
in industrial finishes

today it's VINOC · Lowe Brothers latest development — a finishing system for high speed production

Faster flow of finished castings, reduced handling costs, finishes that resist modern high-speed coolants—these are the demands of today's production. Lowe Brothers "Finishing Specialists" have once more demonstrated their leadership by developing VINOC, a finishing system which meets every modern requirement, yet maintains the highest standards of beauty and wearability which made the Lowe Brothers name great!





ENGINEERED QUALITY



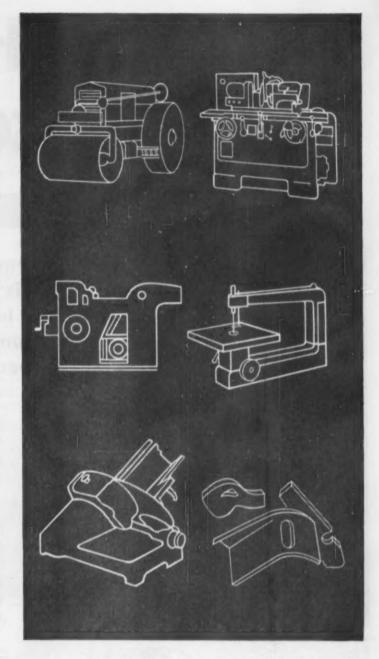


IMPROVED RESISTANCE TO MODERN HIGH-SPEED COOLANTS! Lowe Brothers VINOC finishes have proved impervious to all modern coolants to which they have been subjected—to keep in stride with today's requirements of streamlined production techniques!

FASTER, ECONOMICAL CLOG-FREE SANDING! Pigmentation of Lowe Brothers new filler is such that it does not clog sand-paper! It sands easier—desired smoothness is realized in less time with much less work! What's more, you enjoy a marked savings on sandpaper alone!

FASTER DRYING! Lowe Brothers VINOC system reduces drying time to a new low—speeds handling. Materials dry free of "pinholing"—as a result there's no re-working necessary!

IMPROVED RESISTANCE TO IMPACT AND COM-PRESSION! Large castings take plenty of shocks and scuffs during plant handling operations. Lowe Brothers VINOC finishes are made tougher to resist this rough treatment and thereby reduce need for patch work.



Lowe Brothers new VINOC finishing system is available for either cold or hot lacquer application. Get full details now—see how you can save time and cost while getting finest finishing results with Lowe Brothers' up-to-the-minute answer to the most modern production needs—VINOC! Write today for prompt service without obligation.

LOWE Brothers
FINISHES FOR INDUSTRY SINCE 1870



The Lowe Brothers Company • Dayton 2, Ohio Industrial Division

District Offices: Atlanta • Boston • Dallas Chicago • Jersey City • Kansas City

Here's a to spark

Remington Rand makes this quality steel part at less cost from Republic cold drawn

special sections

Remingem.

REPUBLIC STEEL CORPORATION 3104 East 45th Street Cleveland 27, Ohio

REPUBLIC

Please send more information ont

- Cold Drawn Special Sections
- "Nylok" Nuts
- ☐ High Strength Steels ☐ Tool Steel Warehouse Service

Name_____Title__

Company

City______ Zone___State_____



THE AUTOMOTIVE INDUSTRY is a large user of Republic Special Sections. This wing bushing, above right, for a universal joint is made from the special shape shown above left.

cost-saving idea your imagination

The part is the margin rack for Remington's new Office-Riter. It is produced at less cost because much of the machining is eliminated. The production men at Remington Rand put it this way, "To produce this part from raw bar stock would require costly machining and would result in an inferior part." So they use Republic Cold Drawn Special Sections preformed to the predominating cross section of the part.

If you produce or design steel parts and are interested in reducing costs, you'll want to know more about cold drawn special sections supplied by Republic's Union Drawn Division. You'll want to know more about these advantages.

- 1. Flexibility in design is almost limitless.
- 2. Shapes obtainable in one piece replace costly assemblies

- Special sections simplify built-up, interlocking, or associated parts.
- 4. Benefits from cold drawing are higher strength, greater hardness, a bright smooth finish that rarely requires further machining.

Sections are made to your specifications in all grades of carbon, alloy and stainless steel. While large tonnage requirements are not necessary, they do result in greater economies. We can supply cold drawn special sections in large or small quantities to meet your requirements.

Give you an idea? Send us samples or blueprints of your parts. We will tell you promptly and impartially whether the nature of your parts would make the use of Republic Cold Drawn Special Sections efficient and economical. Mail the coupon for more information.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products



SAVE SPACE AND INVENTORY COSTS on steels for tools, like these milling outlers, by using Republic's Tool Steel Warehouse Service. Warehouses in Detroit and Cleveland carry complete stocks of tool steels, automotive die steels, precision-ground flat stock, cold-drawn shank steel. A phone call brings what you need in a hurry, whether it's one plece or a truckload. Questions on steels, dies, heat treating and machining are answered experity and promptify by our tool steel metallurgists.



HIGH DUCTILITY, PLUS PROVED WEIGHT SAVING, may make you want to know more about Republic High Strength Steels. Their application to various products permits weight reduction up to 25%, And when your product is designed and engineered all the way for high strength steel, weight reduction up to 50% is possible. Republic High Strength Steels are ideally suited for use in structural parts for earth-moving equipment, truck and gasoline trailers, railroad uses. They resist corrosion; extend equipment life by standing up to rough usage.



REPUBLIC "NITLOK" NUTS HELP REDUCE ASSEMBLY COSTS by eliminating lock washers, slotted nuts and cotter keys. Yet they assure positive locking in any position, even under severe vibration. Assembly is speeded, too, because either end of the nut is up. No special tools, lubricants or techniques are needed to start them. "Nylok" Nuts can be backed off for maintenance of equipment and reused. Investigate their use for your product, "Nylok" Nuts are only one of more than 20,000 types and sizes of fasteners made by Republic.

New High-Torque Unbrako self-locking socket set screws

set them, forget them-they stay tight

Up to 40% higher tightening torque—
a new Unbrako feature

	RECOMMENDED SOCKET SET SCREW	1
	TIGHTENING TORQUES	
	(Inch-Pounds)	

	(Inch-Pounds)			MINIMUM
SCREW SIZE	UNBRAKO		c	DIFFERENTIAL %
#4	5	3.9	3.5	28
#5	9	7.8	7.4	15
#6	9	7.8	7.4	15
#8	20	14.7	14.5	36
#10	33	26.5	25	25
1/4	87	62	60 -	40
5/16	165	122	125	32
3/8	290	198	225	29
7/16	430	309	350	23
1/2	620	460	500	24
5/8	1225	1106	1060	11
0 3/4	2125	1540	1800	18
7/8	5000	3660	4600	9
1	7000	5025	6500	8

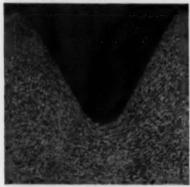
All Unbrakes can withstand higher tightening torques than ordinary set screws. For example, the recommended torque for a $\frac{1}{4}$ " Unbrake is 87 inch-pounds -40% greater than that recommended for an ordinary set screw.

Research has proved that the tighter you seat a set screw the better it works. We went to work to design a socket set screw that could be tightened tighter than ever before without damaging the screw.



We formed a deeper socket. We put a radius in the socket corners. We developed fully formed threads. We established new methods of heat treatment in atmosphere-controlled furnaces. It took almost 6 years' research and development, but the new High-Torque UNBRAKO incorporates all of these improvements. And it retains the selflocking knurled cup point that keeps an UNBRAKO tight up to 48 times as long as a plain cup point set screw, regardless of the size of the point or the cup.

UNBRAKO SET SCREW



We fully form the threads—make the whole screw stronger. The metal is compressed into the closely knit grain structure that you see in this illustration. The grain flow follows the contour of the threads. There are no straight lines along which shear can occur. The UNBRAKO retains its flow lines even when ground down to .010" below root diameter. Screws with cut or ground threads lose thread form at root diameter.

UNBRAKO SET SCREW



We put a radius in the socket corners eliminate the sharp corners where cracks start. This distributes the stresses developed when tightening torques are applied. Ordinary socket screws have sharp corners which often crack when tightened even at lower recommended torques.

UNBRAKO SET SCREW

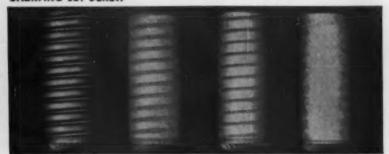






We form a deeper secket—give you more purchase with the wrench. Since more wrench can be put into the UNBRAKO socket, you can set the screw much tighter. And you won't ream the socket or round the corners of the wrench.

UNBRAKO SET SCREW



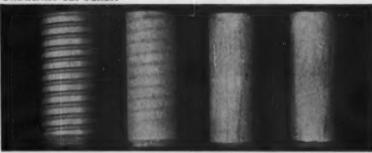
Bitch diameter

Real diameter

.005" below

.010" below

ORDINARY SET SCREW



Pitch diameter

UNBRAKO SET SCREW

Root diameter

.005" below

.010" below

ORDINARY SET SCREW









We heat freat as UNBRAKO properly. It's a ticklish job to heat treat a socket set screw. If you don't do it just right, you get decarburization. And decarb plays havoc with a screw. Put a wrench in the socket and you ream it. Run the screw into a tapped hole and you strip its threads. Try to seat the screw and its point shears off. These photos show the good and the bad. The UNBRAKO is clean. Its grain structure is uniform. There is no decarburization—the ordinary screw is suffering from an overdose of it, socket walls, threads and point are full of the telltale white spots.

You can't buy another set screw as good as an UNBRAKO. See your authorized industrial distributor today. Or write STANDARD PRESSED STEEL Co., Jenkintown 17, Pa.

Visit Booth 828 at the Production Engineering Show see the new UNBRAKO High-Torque Socket Set Screw demonstrated



D SOCKET SCREW DIVISION



JENKINTOWN, PENNSYLVANIA





Ford Cuts Tool Costs with Cross Machine Control Units

One of the
Cross Machine Control Units
at Ford Motor Company's
Cleveland Engine Plant
() S Patent Nos 2679038
and D 163935 Others pending

According to records, 221 Cross Machine Control Units in operation at Ford Motor Company Plants are assisting them greatly in improving tool trouble conditions.

One reason for this is that the Machine Control Unit provides a definite and convenient place for storing tools . . . tools which are pre-set so they can be placed in operation immediately without making machine adjustments.

Another reason is that the Cross Toolometer, an integral part of the Machine Control Unit, provides a standard for the performance of the tools, thereby enabling corrective action to be taken when necessary. The Toolometer dial is set to indicate the number of pieces which a given tool should produce. When the dial has reached that pre-determined figure, the machine automatically shuts down and the tools are changed. At the same time, other tools indicated by the Toolometer as approaching the end of their usefulness are also changed to take full advantage of the machine shut down.

The Cross Machine Control Unit is helping to keep Ford production going and is also assisting greatly in controlling tool life.

See us in Booth No. 1118 at the Machine Tool Show

Established 1898

THE C R 0 555

DETROIT 7. MICHIGAN

Special MACHINE TOOLS

Another Transfer-matic by Cross

Bores, Faces, Drills
and Assembles
2 Types of
Flywheel Housing
Assemblies

- * Processes 2 parts at a time for 2 different engine models.
- * Rough and finish turns and faces engine and transmission mounting faces; drills, bores, chamfers, reams and taps all holes; assembles center bearing and 2 dowels; finish bores and inspects center bearing after assembly; washes, dries parts for final assembly.
- * 314 pieces per hour at 100% efficiency.
- 20 stations: 1 loading; 10 machining; 2 assembling;
 4 inspecting; 2 cleaning; 1 unloading.
- * Pre-set tools to reduce downtime for tool changing.
- Complete interchangeability of all standard and special parts for easy maintenance.
- ★ Other features: Construction to J.I.C. standards; hydraulic feed and rapid traverse; hardened and ground ways; automatic lubrication.

See us in Booth No. 1118 at the Machine Tool Show

Established 1898

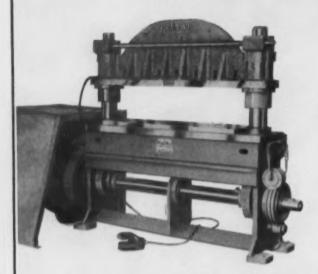
THE

CC

DETROIT 7. MICHIGAN

Special MACHINE TOOLS

PUNCH PRESS



50 TONS CAPACITY
FOR LARGE AREA
LIGHT METAL STAMPING

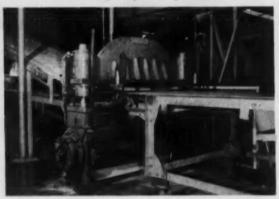
- √ Large Bed Area
- √ Large Ram Area
- / Air Clutch
- √ Air Brake
- √ 6 Models for Your Selection
 24", 36", 48", 60", 72" and 84"
 Working Surfaces of Bed and Ram Lengths

(Above Sizes Also Available in 30 Tans Capacity)

when the sales engineer said a MULTI-MAX PRESS would cut capital investment costs and at the same time increase high speed production.



FOILTAINER, Inc., Sen Gebriel, Californie, manufacturing millions of aluminum foil pans on a specially adapted Multi-Max punch press built to Foiltainer's specifications. Automatic feeding, scrap elimination and conveyor system requires that the press operator only remove and stack pans at end of conveyor belt.



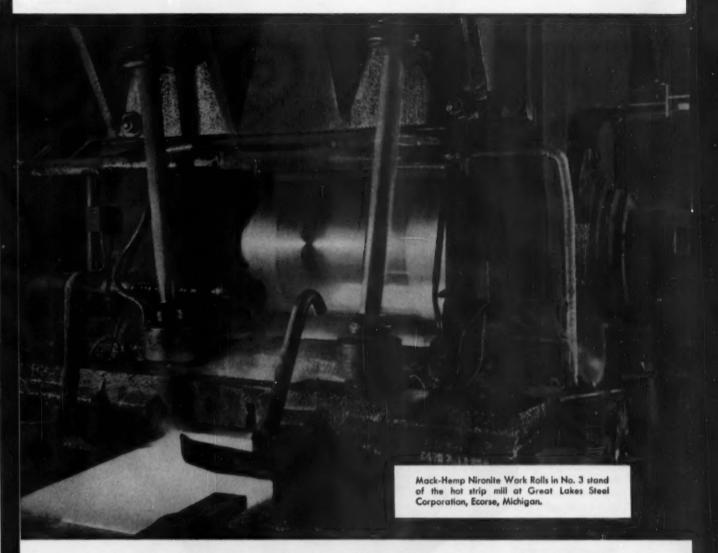
THE MASTIC TILE CORPORATION OF AMERICA, at Long Beach, Celifornia, is annually stamping out millions of square feet of asphalt tile on a Multi-Max Press. The cutting operation is completely automatic. A conveyor belt feeds a continuous sheet of material to the press which cuts out precision 9" blocks and discharges them on to a take-off conveyor.

You Too Can Profit With a MULTI-MAX PRESS in Large Area Light Material Stampings
Write for Catalog or Telephone PArkview 8-7395

DIAMOND MACHINE 100L CO

DIAMOND MACHINE TOOL CO.

PICO, CALIFORNIA



In the hot strip mill stands of GREAT LAKES STEEL CORPORATION...

MACK-HEMP Striped Red Wabbler Rolls set the pace for quality production

Mackintosh-Hemphill points with pride to the important part Striped Red Wabbler Rolls continue to play in assuring top production in the hot strip mills at Great Lakes Steel Corporation, Detroit, Michigan, Division of National Steel Corporation.

Here, as elsewhere, Mack-Hemp Rolls are

upholding their well-known reputation for rolling quality steel at modern high production speeds with low operating costs . . . and long service between changes.

Today's prominent steel producers have found through the years that it pays to keep an eye on what's new and different at Mack-Hemp.



Makers of the rolls with the striped red wabblers PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cost mill rolls . . . improved Johnston parented corrugated cinder pots and stag handling equipment . Mackintosh-Hemphill rotary straighteners . . electrosically controlled comfouring lathes . . . screw feed roll turning lathes . . . heavy duty engine lathes thears . . end-threat bearings . . . steel and special alloy cartings . . ravarsing hat strip mills . . . Y-type cold strip mills . . .





two new Hendey lathes...



32-Speed Geared Head Lathe

This completely new lathe has a 32-speed headstock with the top eight speeds obtained through a belt drive to assure smooth finish on the work. This machine is equipped with a 15 HP motor, and spindle speeds up to 1500 RPM are available. It is designed to accommodate a 20 HP motor for spindle speeds to 2000 RPM. It can be furnished in 13", 16" and 20" sizes. Exclusive induction hardened and precision ground bed ways provide maximum accuracy and long life. Other features include 66 thread and feed changes, an independent lead screw, automatic lubrication, high-speed reversing mechanism, precision automatic stops, and heavy-duty, two-speed tail stock.



See them in action in Booth No. 221

for greater accuracy and production



No. 2E Precision Lathe

The new No. 2E Hendey Lathe is a 14" general-purpose precision lathe equipped with "Selectronic" control of spindle speeds. The electronic unit provides closer control over cutting speeds and full torque at slow speeds. It is an exclusive Hendey feature and is custom built for this lathe. Speeds may be pre-set or changed while cutting, and they are infinitely variable from 15 RPM to 1500 RPM. Low speeds are available through back gears. The spindle starts, stops, and reverses with a single lever control. Other features include dynamic braking, automatic lubrication, precision spindle bearings, and hardened and ground bed ways.

These new modern lathes are Barber-Colman's answer to any questions concerning the future of the Hendey line. They are proof of the strides we have already made and indicate the continued progress which we guarantee in the future. For years Hendey has had a reputation for accuracy. Now, new machines and features provide even closer limits of accuracy and greater production. Electronic and magnetic amplifier drives, induction hardened and precision ground bed ways, and a 32-speed geared head-stock are only a few of the new features available on Hendey lathes. See these new machines in action to determine how they can fill your production requirements.

BARBER-COLMAN COMPANY



6000 CUTS PER HOUR!

WITH A GRIEDER TUBE CUT-OFF MACHINE

NO DISTORTION... MINIMUM BURR...
ACCURACY WITHIN .002"...
CUTS ANY SHAPE...

Cut steel tubing at the amazing speed of 6000 cuts per hour. The Grieder Tube Cut-Off Machine features a heavy duty air operated combination clutch and brake unit that allows continuous operation at this terrific rate of production. Fully automatic... Rate of feed: 600 feet per minute... True cutting. Get full information, multiply your tubing production, reduce costs, write today.





GRIEDER INDUSTRIES, INC.

BOWLING GREEN, OHIO

20th
Century

the persuasive Make a mental note to specify 20th Century "Normalized shot or grit for your abrasive requirements. It's manufactured under close laboratory control to assure consistent high quality, greater uniformity and longer wear.

Foundries and metal-working plants throughout the United States and Canada have found 20th Century "Normalized, the persuasive abrasive, the answer to maximum production efficiency and economy.

Write for our new catalog No. 1153.

THE CLEVELAND

Metal Abrasive

CO.

803 East 67th Street • Cleveland 8, Ohio Howell Works: Howell, Michigan

Various parts for these Caterpillar-built DB tractors are peoned and cleaned by 20th Century metallic abrasives.



One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)

* Copyrighted trade name

a NEW automatic high-speed hobbing machine...





The Barber-Colman No. 3-6 Vertical Hobbing Machine is a single-purpose machine designed and built to meet the requirements of a specific job. The machine has standard basic elements, but the tooling, loading, gaging and handling are designed for maximum production of a specific part. Its high-speed operation makes it adaptable to all mass produced parts up to 3" diameter by 6" face width. Maximum pitch capacity is 10 DP. Hob speeds for carbide hobbing of non-ferrous and non-metallic blanks are available. Features which contribute to the high-speed operation of this machine include exceptionally large heat-treated and ground bed ways, short drives to the work and hob spindles, and a hardened and ground multiple-thread index worm.

In operation at the machine tool show . . . Booth No. 1322, Amphitheater

The No. 3-6 will be in production operation at our booth. Drop in and see it work. Get full information and literature there, with estimates for your jobs.

BARBER . COLMAN

No. 3-6

for high production
gear cutting
with automatic handling,
loading and gaging

automatic loading

Blanks are automatically loaded from a vibratory hopper loading device. However, the type and variety of loading and headling devices with which this machine can be equipped are almost unlimited. Loading can be by megazine or conveyer when required.

automatic gaging

The gaging mechanism segregates gears of the correct size from those that are oversize or undersize. Size inspection is made by measuring over balls. If a pre-determined percentage of gears are out of tolerance, the machine can be made to step automatically. The gaging unit can be furnished to inspect almost any elements of the goor.

automa<mark>tic hob s</mark>hifter

The automatic hob shifter can be set to shift a certain amount after each cycle, or if can be arranged to shift after a certain number of parts have been cut. Shifting increments can be changed easily by means of a graduated dial. The hob stide is clamped pneumatically.

centerdistance adjustment

The hole is set to the proper depth by means of a conterdistance adjusting mechanism, eliminating the usual time-consuming method of setting the hole to depth. The hole is placed in a fixture, and an indicator finger is set applied the outside diameter. The indicator is calibrated to show the conterdistance between the work and the hole. This conterdistance setting is made by means of a graduated dial on the machine.

Some basic machine facts:

- Short, Compact Drives to Work and Hob Spindles
- Anti-Friction Work and Hob Spindle Bearings—Tapered Roller Type
- Pneumatic Work Clamping
- Self-Contained Lubrication and Coolant Supply
- Heat-Treated and Ground Bed V-Ways
- 2 HP, 1800 RPM Drive Motor
- Unitized Construction

HOBS • CUTTERS • REAMERS
HOBBING MACHINES
HOB SHARPENING MACHINES



Barber-Colman Company

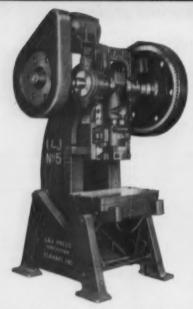
GENERAL OFFICES AND PLANT, GEO ROCK STREET, ROCKFORD, ILL.

HOBS AND MACHINES SINCE 1911

August 25, 1955

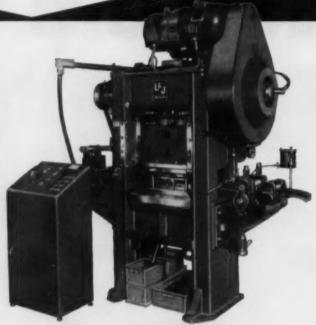
43

LaJ PRESSES - Cost Cutters!



NEW No. 5 O.B.I. Geared Punch Press

Versatile, rugged press of 56 ton capacity. Air clutch available. Also non-geared model.



No. 20-2-24 Double Crank, Straight Side High Speed Press

High speed for small precision parts in volume. 20 ton capacity. Speeds to 450 s.p.m.



NEW No. 6 O.B.I. Geared Punch Press Sturdy, efficient press of 65 ton capacity. Air clutch available. Also non-geared model.

SEE THEM IN ACTION AT BOOTH 407



The best way to prove the efficiency of L&J Presses is in your own shop—on your own work. You can see how their balanced design and rigidity minimizes deflection, holds tolerances and gives longer die life. You'll also find that they give long, dependable service with very little maintenance. Their big advantage is lower production costs.

You can see them in action at The Machine Tool Show. Let us show you how they are built to give you better work. If we won't have this opportunity, write for literature.

L&J Press Corporation, 1623 Sterling Ave., Elkhart, Indiana



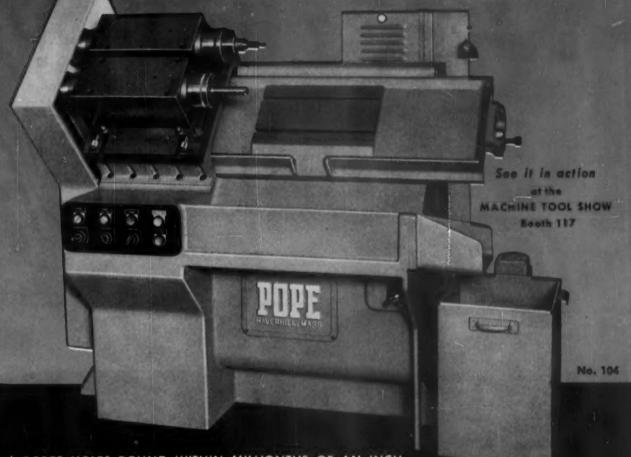
NEW! Press Load Indicator

Measures press load under actual working conditions — very helpful in determining required press tonnage.

L&J PRESS CORPORATION



BORING MACHINE designed and built by



- * BORES HOLES ROUND WITHIN MILLIONTHS OF AN INCH
- Electrically controlled table provides infinitely variable feed and traverse all in one separate cabinet.
 - no cams, no change gears, no sprockets, no linkages.
- 4- Automatic operating cycle includes timed loading period when desired.
- Forty-five degree angle table and bridge for rapid loading and unloading free flow of coolant and chips.

For super-precision boring and the continuous production of accurate parts — For the very latest design in simplicity and versatility —

WRITE FOR NEW BULLETIN S-9

Specify the NEW

POPE

R-2 Super-Precision BORING MACKINE

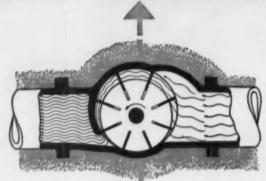
POPE MACHINERY CORPORATION

Established 1920

261 RIVER STREET, HAVERHILL, MASSACHUSETTS

Growing Plants need PLENTY

of AIR!



As abundantly demonstrated in thousands of successful installations, the simplest, most economical and most reliable source of compressed air for all pnuematic plant services is the Fuller vane-type Rotary Compressor.

This compressor has an irreducible number of moving parts—rotors, blades and bearings—and for this reason it is ideally adapted for continuous service in out-of-the-way locations without attention.

With direct-connected motor drive and operating with incredible lack of vibration, these compressors run for days on end without even being seen, much less inspected.

When you need such performance, it will pay you to specify Fuller Rotaries—for pressure up to 125 psig. and capacities to 3300 cfm.

Detailed information on design characteristics, and typical applications will be forwarded promptly on request.



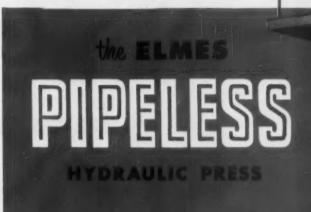
FULLER COMPANY, Catasauqua, Pa.

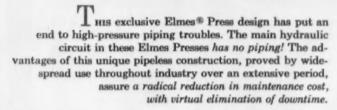
GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
Chicago · San Francisco · Los Angeles · Seattle · Birmingham

pioneers in harnessing AIR

another

Outstanding Elmes Development





In Elmes Pipeless Presses, all high-pressure hydraulic fluid is conducted through short, direct passages drilled in the structural parts. There are no high-pressure screwed joints to loosen, no oil dripping from loosened fittings, no breaking of welded joints. Press operation is smooth, quiet. Reversal of the ram is shockless. Vibration is greatly reduced. Turbulence and oil heating are minimized. Response to electrical controls is prompt and precise.

Any Elmes Metalworking Press, standard or special, can be equipped with pipeless construction—and at no premium. Find out now how your production will benefit from the matchless performance of Elmes Pipeless Hydraulic Presses. A proposal to suit your particular requirements, or further information, will be supplied on request. Contact your Elmes Distributor or write us direct.

HIGH-SPEED "PIPELESS" PRESS with two reversible pumps

450-Ton Elmes Single-Action Metal Drawing & Forming Press, with many special features including the revolutionary Elmes Pipeless construction. This press employs two reversible pumps, providing the following operating speeds per minute: advance —550°, press—126°, return—550°.



Be sure to see the Elmes
PIPELESS Press
in operation at the Show

ELMES

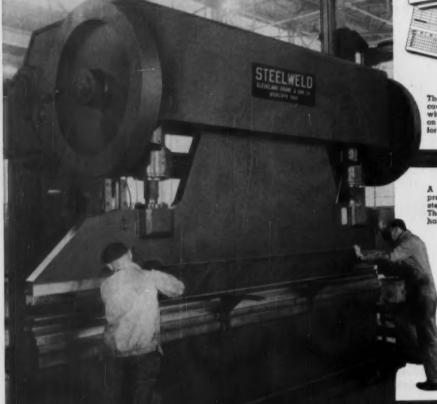
AMERICAN STEEL FOUNDRIES • ELMES ENGINEERING DIVISION
1166 Tennessee Avenue...Cincinnati 29, Ohio

HYDRAULIC PRESSES & EQUIPMENT

METAL-WORKING PRESSES . PLASTICS MOLDING PRESSES . PUMPS . ACCUMULATORS

Accurate Records Prove

LOW COST OPERATION



These forms enable the Chicago Plant to develop records which provide concrete facts on repairs and scalatenance for all machines.

A Steelweld Model 14½-10 press working on various size steel plates up to 16'-0" x ¼'. The ease with which the hand-cranked back gauge is

cranked back gauge is adjusted is a favorable leature. The press is easily logged in minute amounts. Shown is a 14.6" x 1/4" plate being formed for a hopper. Link-Belt manufacture.

Link-Beit manufactures a wide variety of conveying and processing equipment such as apron, screw, oscillating and overhead chain trolley conveyors, railroad car dumpers, bucket elevators and other handling equipment.

SOME YEARS AGO the Pershing Road Plant of Link-Belt Company, Chicago, established a record system for keeping track of repairs and maintenance costs of all machine tools. This system provides a detailed history of maintenance required and lists every item of expense for every machine.

The record system proves that the maintenance

cost for Steelweld machines, both bending presses and shears, is comparatively low.

Because of this, and the fact that Steelweld machines have many desirable operational features, a number of which are unavailable elsewhere, Link-Belt regards them highly. In fact, so much that 20 Steelweld Presses and Shears are now serving Link-Belt plants in nine cities.

THE CLEVELAND CRANE & ENGINEERING CO.

4859 EAST 281st STREET, WICKLIFFE, OHIO



STEELWELD BENDING PRESSES

BRAKING . FORMING . BLANKING . DRAWING . CORRUGATING . PUNCHING



a light touch

New concepts of hydraulic headstock design permit a blending of operator skill and machine response never before achieved . . . all resulting in effective use of a wider choice of speeds and extra heavy duty metal cutting capacity.

THE WARNER & SWASEY COMPANY . CLEVELAND 3, OHIO

SEE

DOWN . TO . EARTH

SHOP JOBS

AT 717

THE MACHINE TOOL SHOW





Machine designs change, but practically all these changes are made to improve methods for machining jobs such as you have in your own plant right now!

That's what we believe you want to see at the Machine Tool Show—better methods for doing your work. And that's exactly what you'll see at the Warner & Swasey booth . . . the most modern machines, utilizing the latest production techniques, turning out typical shop jobs.

We believe you will take home an important "souvenir" of your visit to Booth 717 . . . ideas on how you can machine metal more efficiently, more profitably!













NO MATTER WHICH WAY YOU TURN ... WARNER & SWASEY CUTS COSTS



If you use machined parts like these HARPER can save you up to 50%

There are thousands of parts being milled from bar today that could be cold headed by Harper at big savings to manufacturers.

Harper's engineers are specialists in cold heading and have had wide experience in the design and production of unusual specials from nonferrous, stainless steel and high temperature alloys.

Harper field engineers are available to work with

you on any fastening problem. Call the nearest Harperoffice or write direct.

Harper is also the largest exclusive producer of bolts, nuts, screws, washers, rivets from corrosion-resistant metals. Branch offices and distributor's warehouses are located in every major market area.

> THE H. M. HARPER COMPANY 8215 Lehigh Avenue, Morton Grove, Ill,

Specialists in all corrosion-resistant fastenings

Bolts • Nuts • Screws • Rivets • Washers of Brass • Bronze • Monel • Aluminum • Stainless

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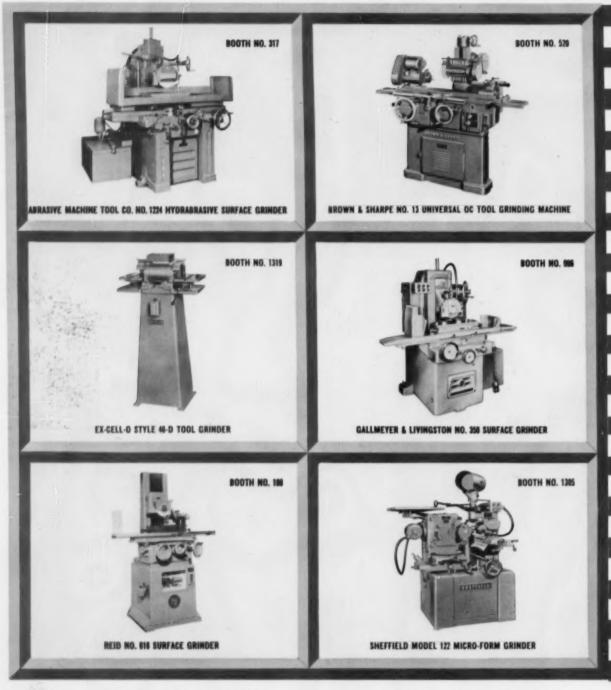
OVER 7000 ITEMS IN STOCK ... HARPER DISTRIBUTORS EVERYWHERE



EVERLASTING FASTENINGS

Look for CARBORUNDUM' at the Machine Tool Show

...ON THE LEADING



THE NEWEST DEVELOPMENTS in grinding machines will be on display at the Machine Tool Builders Show in Chicago. See them all-and notice how many models of these modern machines are equipped with CARBORUNDUM Brand Grinding Wheels.

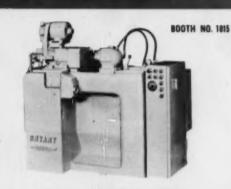
THE MACHINE BUILDERS' DECISION to use Wheels by CARBORUNDUM on their show machines is your most positive assurance that the brand name CARBORUNDUM means precision ...higher production...lower cost per unit machined. For engineering helps on your specific grinding problems, ask your CARBORUNDUM Distributor or salesman.



GRINDING MACHINES

BOOTH NO. 1111

BOOTH NO. 1407



BRYANT NO. 1209 INTERNAL GRINDER



COVEL NO. 32 UNIVERSAL AND TOOL GRINDER



JONES & LAMSON MODEL "E" AUTOMATIC FORM GRINDER



OLIVER AUTOMATIC FACE MILL GRINDER



THOMPSON STYLE "D" 6 X 10 X 10" SURFACE GRINDING MACHINE



VAN HORMAN NO. 4BG1 BOW GAGE HIGH PRODUCTION PLUNGE CUT GRINDER

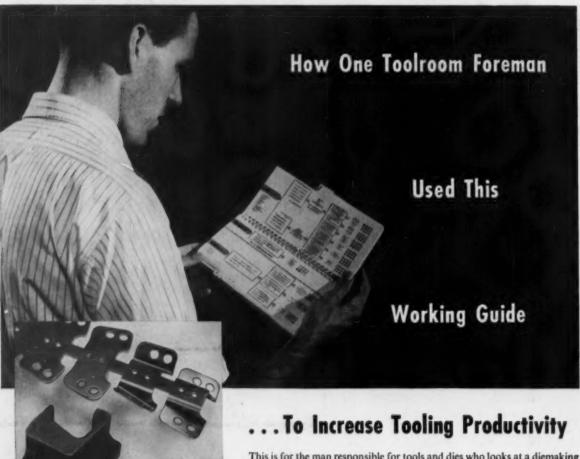
CARBORUNDUM

... continually putting more SENSE in your abrasive DOLLAR

AMERICAN MACHINIST and STEEL, Aug. 29; GRINDING & FINISHING, Aug.;

PRODUCTION and METAL WORKING, Sept.

81-6120



Job: Punch that blanks stampings from SAE 1010 strip, .062" thick.

Problem: The punch is so unbalanced in design that safety in hardening is vital. Also, the punch is shear fitted to the die, and hardening accuracy is necessary to avoid expensive adjustments after heat treating. Other die steels were tried, but they either broke or changed size too much.

Solution: At this point the Toolroom Foreman called in Carpenter and started to become more familiar with the Matched Tool and Die Steel Manual. The Manual pointed to Carpenter Vega (Air-Tough) Die Steel for the punch. Now they're coming through right on the nose. Moreover, production between grinds has jumped from about 10,000 to 50,000 stampings. And the Foreman says that from here on, all his tools and dies will be made from Carpenter Matched Tool and Die Steels. (Write for a more detailed Field Report on this job.)

This is for the man responsible for tools and dies who looks at a diemaking job with these thoughts:

"How can I make it easier?"

"How can I avoid costly heat treating hazards?"

"What can I do to improve the job?"

If you're that man, Carpenter wants to help. We offer you plain, *practical* help based on almost 70 years' experience working with other men who feel like you do.

How does it pay off? Look at a typical example shown to the left! And your Carpenter representative can show you many more Field Reports of other interesting jobs.

Much of this help is packed into a 189-page working guide . . . Carpenter's "Matched Tool and Die Steel Manual". And that's only part of the program . . . a program backed by dependable die steels developed in Carpenter Research Laboratories with a long record of pioneering in new and improved steels.

We're ready to work with you, now. A call to your nearest Carpenter Mill-Branch Warehouse, Office or Distributor will tell us you are, too.



Carpenter Matched Tool and Die Steels

IMMEDIATE DELIVERY from local warehouse stocks

THE CARPENTER STEEL Co.; 121 W. Bern St., Reading, Pa. Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"



NOMI

"F" SERIES

A Complete Line of Cost-Cutting

EDLUND Drilling and Tapping Machines

The Right Machine for You...

For Your Job ...

For Your Product ...

Whether you require light drilling operations of a sensitive nature, medium drilling and tapping, or heavy duty operations in all types of materials, there is an Edlund 'F" Model for you.

Edlund Model 4F
Drilling and Tapping Machine
For Heavy Duty Drilling and Tapping Operations
Infinitely Variable Speeds to 2200 RPM
12" Overhang, 11/2" Capacity

Cost-cutting features make Edlund "F" Models the logical choice for plant expansion and for replacing obsolete equipment. Standard or Special Models from 1 to 8 spindles, with Power Feed, Reversing Motor Tapper, Lead Screw Tapper, and Back Gears are Available.

Let us supply you with case history folders, descriptive bulletins, complete specifications and quotations. Write us today at no obligation.

Edlund Representatives in Major Cities

See these machines in operation — Booth 115, NMTBA Show, Chicago.

EDLUND MACHINERY COMPANY

Cortland, New York

Division of Bradley Ediund Corp

MACHINE TOOL SHOW
SINGAR, ILL - SAPE. A-IZ, IVES
SINTERNATIONAL
AMPRITHEATOS



OPEN HOUSE

EXHIBIT

Every visitor to the great Chicago Machine Tool Show and Metalworking Machinery and Equipment

Exposition is invited to Dreis & Krump's open house. This open house and exhibit will be conducted every day September 6 to 17, except

Saturday and Sunday, from 9:00 A.M. to 5:00 P.M. Especially, those interested in forming, bending, punching, and notching sheet metal and the bending of steel plate for weldments, etc. will find it well worth their while to visit us.

Something new will be on display—shown for the first time—four new models of light duty press brakes. Also we shall have models of all types of CHICAGO equipment to demonstrate the bending of steel plate and the forming and bending of sheet metal. Our engineers will be available to discuss the application of this equipment to your requirements.

Plan now to attend this open house and exhibit.

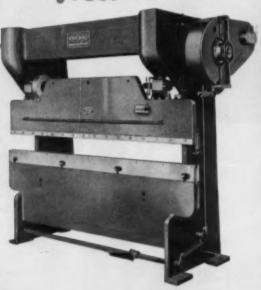
NEW PRESS BRAKE





NEW PRESS BRAKE

NEW PRESS BRAKE



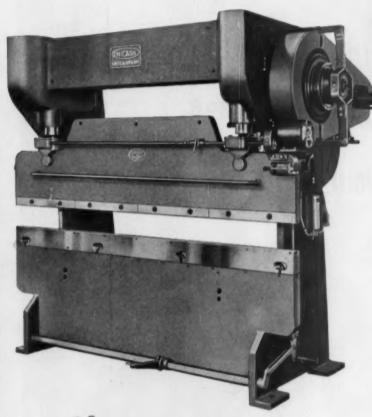


Only 15 Minutes Taxi Ride from International Amphitheater

DREIS & KRUMP PLANT

during the

CHICAGO MACHINE TOOL SHOW



NEW SERIES L PRESS BRAKE

September 6-17

Daily 9:00 A.M. to 5:00 P.M. except Saturday and Sunday

In Operation

Series D CHICAGO SS Press with 50"x172" die area, set up for performing over 50 punching and notching operations in a single stroke on a sectional cooler panel.

Automation

Series D CHICAGO SS Press set up for continuous automatic production of No. 55 detachable-link sprocket chain—from coiled stock to complete chain without scrap.

And on Display

CHICAGO Standard Heavy Duty Press Brakes

CHICAGO Power Bending Brakes

CHICAGO Power Folder Brakes

Single and Double Wing Models for folding or tangent bending.

CHICAGO Hand Bending Brakes

See

Dreis & Krump Press Brake Die Exhibit and Method of Induction Hardening Press Brake Dies for long life.

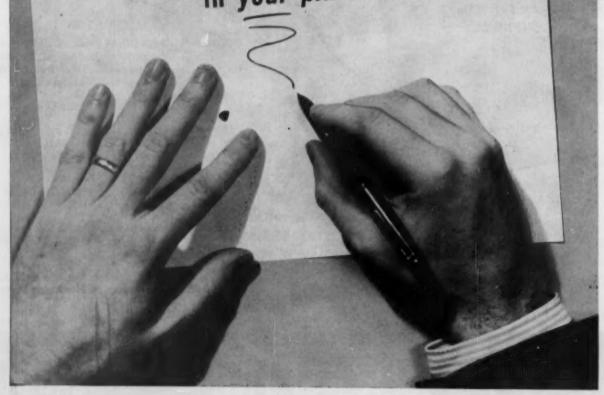
6828

DREIS&KRUMP

MANUFACTURING COMPANY, 7400 S. Loomis Boulevard, Chicago 36, Illinois

CHICAGO DREIS & KRUMP doesn't this make good sense to you...

The same HOUGHTON PRODUCTS that perform so well in machine tools operated at the Show will also work to best advantage in your plant!



ois l

As a machine tool operator you have one thing in common with the machine tool manufacturer:

You both want the most efficient performance you can get!

So it does make sense to use the same high quality Houghton lubes, greases, coolants, cleaners and rust preventives used by so many exhibitors at the Machine Tool Show.

All you need do to benefit from these same products is to try them! You'll also like the experienced on-the-job service you get.

See the Houghton Man at Booth 318 or write for bulletins, to E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

These Products will Make Sense in Your Shop, too!

COOLANTS AND CUTTING OILS

for dependable metal cutting

Houghton supplies a complete line of water soluble coolants compounded and fortified to provide maximum production, outstanding tool life and the finish you want. You can be sure of getting every possible unit of production from your machines with Houghton cutting fluids.

"HOUGHTO-GRIND" for most efficient oil-free grinding

This oil-less grinding compound is rust-inhibitive when mixed with high dilutions of water. There's no oil to separate and load up wheels, so glazing and grinding checks are eliminated. Low-cost, too, in dilutions up to 200 parts water.

WAY LUBRICANTS"

that won't "slip-stick"

Chatter, galling and excessive wear of machine ways are eliminated when Houghton Way Lubricants are on the job. They are high in lubricating properties and low in friction. They provide high film strength and a marked affinity for metal. You can smooth-out the operation of your machine tools with Houghton Way Lubricants.

"HOUGHTO-CLEAN"

for cold cleaning of metals

Room temperature metal cleaning compounds for production lines; make costly heating equipment unnecessary, keeps department cooler, worker morale higher, cleaning costs down, safe and effective.

"HYDRO-DRIVE"

Fortified Hydraulic Oil

Hydro-Drive has everything a hydraulic oil needs: selective viscosity for efficient operation and high viscosity index; high filmstrength that prevents wear; oxidation stability that keeps it on the job for years and contains solvent properties that keep the system clean.

HOUGHTON "RUST-VETO"

for maximum rust prevention

From indoor corrosion protection of highly finished parts to outdoor rust prevention for machinery and dies, Rust-Veto was first in the field—and still is. A wide range to meet industrial and government "specs".

PHILADELPHIA . CHICAGO . DETROIT . SAN FRANCISCO

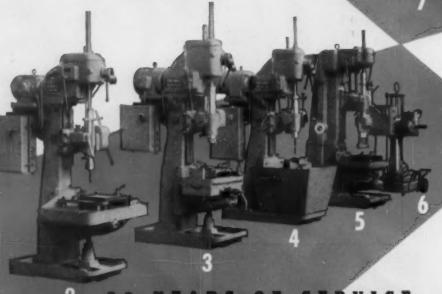
Ready to give you on-the-job service . . .

SEE HOUGHTON'S HYDRAULIC DISPLAY AT THE SHOW—OILS, FLUIDS, ADDITIVES AND PACKINGS BOOTH 318

SEE PROFIT-MAKING
Cincinnati Bickford
SUPER SERVICE
DRILLING MACHINES

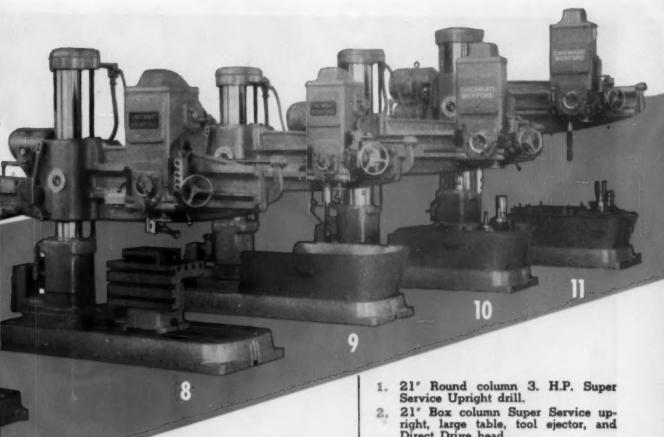
BOOTH 901

THE
MACHINE TOOL
SHOW
CHICAGO, ILL.
SEPT 6-17, 1950



SO YEARS OF SERVICE

BICKFORD



Another forward stride, in our 80 years of drilling machine development, is today's introduction of the new hydraulic preselector for all speeds and feeds on Super Service radial drills.

See it . . . and the startingly simple prescheduling arrangement.

See the new 12 speed head Super Service radial with 9" diameter column, or 11" column and 5 or 7½ H.P.

See new cost cutting features on Super Service Upright drills . . . 11 machines in operation at Booth 901.

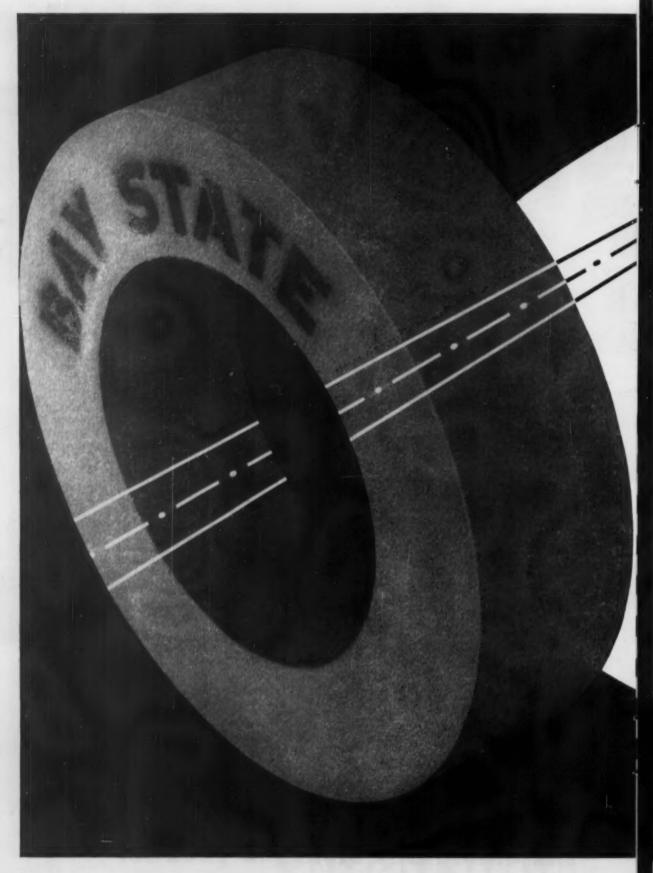
- right, large table, tool ejector, and Direct Drive head.
- 24" Super Service upright, compound table, jig-borer spindle.
- 28" Super Service upright, automatic electrical tapping reverse.
- 28" Direct Drive upright, flanged quill, drill head.
- 6. Portable horizontal drill, 11/2 H.P., 6 speeds.
- 3' arm 9" column high speed Super Service Radial, automatic tapping reverse, 9 speeds. 4 feeds, 3 H.P.
- New 4' arm 9" column Super Service Radial, 12 speeds, 6 feeds, 5 H.P.
- 9. New 4' arm 11" column Super Service Radial, power head traverse, 12 speeds, 6 feeds, 71/2 H.P.
- 10. New 5' arm 15" column Super Service Radial featuring hydraulic speed range preselector, 36 speeds, 18 feeds.
- 11. New 6' arm 19" column Super Service Radial, hydraulic 100% preselection of 36 speeds and 18 feeds . . . and a unique prescheduling device.



RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.



56

- .. Produce more work with less dressing
- ... Meet your production requirements
- ... Have greater stamina

Your present centerless grinding wheels may be giving all the production you need. However . . .

In case after case, BAY STATE factory and distributor abrasive specialists are finding ways to improve even such apparently satisfactory conditions, by more accurate wheel selection.

There are good reasons for this. For example, the exclusive Fractional Grades and Controlled Structure give BAY STATE engineers a wider choice from which to select the exact degree of wheel hardness and structure to meet each job's requirements. This wider-range of wheel characteristics becomes increasingly more important as specifications of metals, tolerances, and finishes become more difficult to meet.

We are confident that the combination of these product features and engineering skills applied to your centerless grinding can give top conditions for real production. We invite you to ask us to prove that this is true.

Send for Bulletin 201. Better still ask us, or any BAY STATE DISTRIBUTOR, for free engineering analysis.





Setting speeds and feeds made as easy as tuning a radio . . . so simple any one can pre-set it.



Operator is free to concentrate on starting and stopping spindle, changing cutting tools . . . speeds and feeds have all been pre-set.

now you can plan and
... with the new

Carlton

The Carlton Machine Tool Co. announces the introduction of the new Carlton-Leber speed-feed pre-selector and program systems. The two new devices offer faster, and therefore more economical hole drilling production.

Programming Here's how the Carlton-Leber programming works: your production engineering department studies the workpiece drawing and determines the sequence of drilling operations and the correct speed and feed for each. This data is recorded on a routing sheet or blueprint

Carlton Radial Drills now come with your choice of 3 different



Manual gear shift: 2 shifter levers for controlling speeds, 2 shifter levers for controlling feeds.



Pre-select gear shift: 1 speed graduated dial and 1 feed graduated dial pre-set speeds and feeds.

pre-set speeds and feeds for an entire drilling program

programming

and is transferred to the programming console.

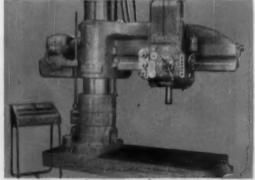
The programming console contains an indexing dial which shows the operation sequence number being performed. Operator has local control and can perform operations out of sequence by manually advancing or reversing the indexing dial.

Pre-selector For less lengthy or complicated drilling jobs, the programming unit can be disconnected through a selector switch and the pre-selector then becomes operative. The pre-selector saves time by allowing operator to select the

speed and feed for the next operation while the machine is under cut. Pre-selector may be furnished with or without the programming unit. In fact, you can now buy your Carlton radial drill with your choice of one of three different types of speed-feed control as illustrated below.

Be sure to see the new Carlton-Leber pre-selector and programming devices in action at the Machine Tool Show in Carlton booth 919. In the meantime, write for your descriptive bulletin. The Carlton Machine Tool Co., Cincinnati 25, Ohio, U.S.A.

speed-feed controls ...



Pre-selector and programming gear shift sets up correct speeds and feeds for a complete sequence of operations.

Carlton

horizontal and radial drills



You're invited . . . to see the new Carlton-Leber pre-selector and programming devices. Visit us in booth 919 at the Show.

A Good Team to Team with

BEFORE FREEZING YOUR NEW MODEL DESIGNS FOR PRODUCTION

Tomorrow's equipment will have to run faster, work harder, last longer. The new product you may

now have under development is probably no exception. That's why you are giving it the design forethought that will assure improved performance and longer trouble-free life. And that's just where Aetna is uniquely qualified to help.

With nearly forty years of experience in designing special bearings and parts for volume production, our engineers can be of real assistance to your own design department . . . can assure you the consistent quality and extreme uniform

accuracy that speeds assembly, cuts costs, improves product service-ability and saleability. Your inquiry will receive our immediate attention.

Aetna

AETNA BALL AND ROLLER BEARING COMPANY

DIVISION OF FARKERSBURG-AETNA CORPORATION

4600 Schubert Avenue . Chicage 39, Illinois

Standard and Special Bell Thrust Bearings • Angular Contact Bell Bearings • Special Roller Bearings • Ball Retainers • Hardened and Ground Washers • Slooves • Bushings • Miscellaneous Parts

At Booth 915 you will see Automatic Drilling and Tapping in "Operations Kingsbury"

You'll see the operator place a die casting in a work-holding fixture. You'll follow this casting as it cycles through 10 work stations, while 28 spindles perform 33 operations from five directions. And you'll see the prinched part delivered to the operator a few seconds later.

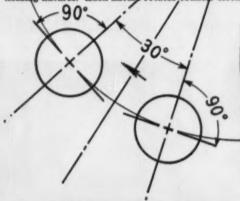
This Kingsbury machine is the twin brother of the which is now producing up to 880 parts per hour gross of a cost of not more than 8 1/4 per part. The job is updated, even for a Kingsbury. Print called for work on 1/6 hele from four directions horizontally, and from the vertical This is accomplished with seven Kingsbury units mounted on a 100-inch diameter base.

The Index Table is 26 inches diameter and has 12 work-holding fixtures. Each fixture rotates counter-clockwise 90°

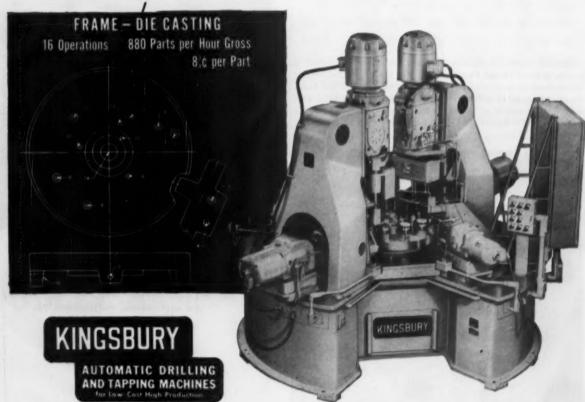
while the table indexes 30° clockwise. One operator loads and unloads the machine. Tool bushings guide the cutting tools. Electrical wiring and cabinet follow J.I.C. specifications.

Each Kingsbury is a special machine, designed and built at Keene, New Hampshire, by men who have accumulated a vast fund of experience in this highly specialized work. It co-ordinates multiple operations into a continuous production cycle — produces accurate, interchangeable parts rapidly and economically. Perhaps a Kingsbury can help you in your business.

Kingsbury Machine Tool Corp. 113 Laurel Street, Keene, N. H.



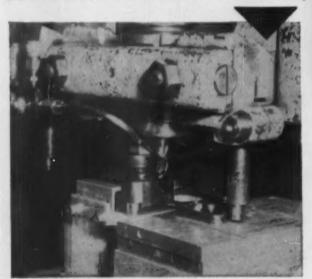
WORK PERFORMED	HOLES NUMBERED														
BY SPINDLE	1	2	3	4	5	6	7		9	10	П	12	13	14	15
MACH	INE	ŠĪ	ATI	ON	NU	M	BER	5							
Horizontal Units		-							-	-	-	_	-	-	_
Drill and Countersink				1	4		2			3					
Тар				7	10		8			9					
Vertical Units															
Drill	2	1	3			2		1	3		1	2	3		6
Ream and Hollow-Mill														5	
Tap		7	9					7	9		7		9		
STATIONS WORKING ON HOLE	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
WORK PERFORMED PER HOLE	2	2	2	3	3	2	3	2	2	3	2	2	2	2	

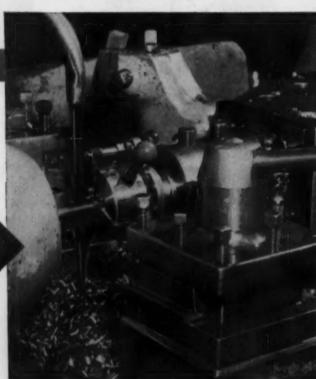


"We found the key to successful machining of ti-stainless--GULF ELECTRO CUTTING OIL"

says Mr. D. E. Gillmor, Vice President of Gillmors, Inc., Long Island, N.Y.

Improved machining practice on ti-stainless quickly followed a switch to Gulf Electro Cutting Oil in this shop, with results like these: from 20 pieces per tool grind to as many as 45; and finish improved about 43 microns—from 63, the best obtainable with other cutting oils, to as low as 15. For additional information, see page 144 of the September 13, 1954 issue of American Machinist.





Gulf Oil Corporation - Gulf Refining Company



Mr. D. E. Gillmor, Vice President of Gillmors, Inc., Gulf Assistant District Manager Don Gallaher, and Mr. George Glaeser, General Foreman of Gillmors, examine several of the ti-stainless parts machined with Gulf Electro Cutting Oil.

"WE tried scores of cutting oils over a period of months in an effort to increase tool life and get a better finish in machining type 321 titanium stainless steel. Then a Gulf Sales Engineer recommended Gulf Electro Cutting Oil.

"Right away results were phenomenal. Tool life was increased over 40% and surface finish was improved 43 microns."

Gulf Electro Cutting Oil has proved to be the answer to many tough machining problems like this. It contains both free sulphur-held in stable solution-and sulphurized mineral oil, in which the sulphur is chemically combined by an exclusive Gulf process. This combination provides high sulphur activity over the entire range of a cutting operation-gives the tool maximum protection and helps to reduce built-up edge. It also has excellent anti-weld characteristics and extreme load carrying ability.

And remember that Gulf provides a complete line of quality cutting oils that will help you get improved production and longer tool life in all your machining operations. Write, wire, or phone your nearest Gulf office and have a Gulf Sales Engineer recommend the most suitable type for every job.



FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS



To develop their best qualities demands exclusive care. That is why Sun Ship's new Alloy Products Shop has been planned for the exclusive fabrication of stainless and alloy steel products. When you have selected from the many available Alloys a stainless steel best suited for your service condition, you have done only half the job. You must also provide for the best possible fabrication if you are to have full protection—"A Thoroughbred Job."

Why entrust stainless steel to be fabricated in the same shop where carbon steel products are fabricated, and subject this precious metal to contamination with iron fragments, dust, or other harmful elements? A segregated shop is your answer.

Sun Ship now operates an all-alloy shop, one especially built and equipped for fabricating stainless and alloy products as they should be—segregated from carbon steel fabrication.

We emphasize the fabrication of medium and heavy stainless, alloy and aluminum products for industry.

Try Sun Ship for stainless fabrication as it should be done.

Our Sales Engineering Department will be pleased to assist you with any of your fabrication problems.

Sun Ship also makes all types of carbon steel pressure vessels.

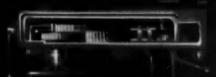
ALLOY PRODUCTS SHOP

OF SUM SHIPBUILDING & DRY DOCK COMPANY

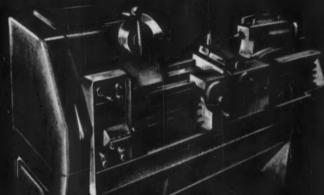
ON THE DELAWARE . CHESTER, PA. . 25 BROADWAY, NEW YORK CITY

of Cincinnati

AT THE SHOW



NEW 16" APRON



New 15" DUAL DRIVE



New 32" Spindle



NEW HEAVY DUTY BED





NEW HEAVY DUTY TAILSTOCK



Turn the page for a preview







CUT WITH CONFIDENCE... WITH THESE

NEW

13", 15", 17" and 19" Regals

Designed and built like heavy-duty lathes, the new LeBland Regals offer a long life of precision production, minimum maintenance and true big-lathe dependability! New headstock uses proven gear-belt drive design. New bed has replaceable hardened and ground steel ways. Other big-lathe features—Separate feed rod and leadscrew. 3-bearing spindle. Automatically-lubricated quick-change box. Many more. Ask for Bulletin R-2005.

15" Dual Drive

For medium-duty performance at low cost, the new LeBlond Dual Drive is number one! With a single lever you get 16 spindle speeds from 30 to 2400 rpm. The headstock is of combination gear-belt drive design with a 3-bearing spindle. Motor is 5 hp., 1800 rpm. Quick-change box is totally-enclosed. Replaceable hardened and ground steel ways are fitted to the compensating veeway principle for the best distribution of forces. Act for Bulletin 65.

16" Heavy Duty

Completely redesigned from top to bottom, our new 16" is the most advanced heavy duty in the business! The combination gear-belt drive headstock provides 27 spindle speeds. The center spindle bearing is supported in the new Timken "semi-flexible mounting" for precise support throughout the speed range. Four-way power rapid traverse. 20 hp. Totally-enclosed quick-change box. Replaceable hardened and ground steel bed ways. Ask for Bulletin HD126S.



ND) AT THE SHOW



We are extremely proud of the major design advancements you'll see at the LeBlond Exhibit—No. 1313, dead center in the new Exhibition Hall. You'll see 16 of the world's most modern lathes. You'll witness unique demonstrations in tracing, rapid boring and high-power turning. Don't miss LeBlond!



NEW 13", 15", 17" and 19" Regal Lathes

Famous for dependable performance at low cost, our Regals have been redesigned from the ground up! Biglathe features include — Combined gear and belt-drive headstock. Replaceable hardened steel bedways. Separate feedrod and leadscrew.

NEW 15" Dual Drive Lathe

Best buy in the medium-duty class, the new Dual Drive features 16 speeds from 30 to 2400 rpm through a combined gear and belt-drive headstock. 5 hp. Replaceable hardened steel bedways. Totally-enclosed quick change box.

NEW 16" Heavy Duty Laths

Most popular of the heavy duties, our new 16" provides 27 speeds from 16 to 2000 rpm through a combined gear and belt-drive headstock. 20 hp. Four way power rapid traverse. Replaceable hardened steel bedways. Enclosed quick change box.

RT Toolroom Lathe

Even today, other lathes can't match the advanced designs pioneered by LeBlond in the RT. Universal QC box—90 feeds and threads. Automatic chasing stop. Combined feed apron with built-in taper attachment.

NEW 25" and 32" Heavy-Duty Lathes

Cut with confidence at high horsepower! New headstocks use heavy, short shafts; 4-bearing spindle; provide adjustable accelerations for starting, stopping, jogging. 50 hp on the 25", 60 hp on the 32".

NEW 32" Special Heavy-Duty Lathe

You'll see well over 100 hp actually used at the tool. Built for Carboloy to test the newest in carbide tooling, this special 32" uses a 125 hp, variable speed drive, provides speeds from 42 to 1400 rpm.

NEW 25"/50" Sliding Bed Gap Lathe

A brand new model of this most versatile of lathe designs. Headstock provides 36 spindle speeds from 6 to 625 rpm. Adjustable acceleration for starting, stopping, jogging. New bed increases stability, easy cleanout.

50" Roll Turning Lathe

See how huge steel mill rolls are contoured in less than half former time. Two-directional hydraulic tracing from a simple template. Feed and speed can be varied during cut without leaving a tool mark.

NEW Automatic Crankshaft Lathe

Fifty-five crankshafts per hour are turned on the fastest crank-turning equipment yet developed. Five main bearings, flange and pilot, sprocket diameter and front end turned simultaneously. Transfer is automatic.

NEW LeBland-Carlstedt Rapid Borer

Entirely new concept in high production of deep holes. Designed expressly to accommodate the new boring method and tooling developed in Europe. Don't miss this demonstration—see holes bored 3 to 8 times faster than ever before!

... cut with confidence

THE R. K. LEBLOND MACHINE TOOL COMPANY

CINCINNATI 8, OHIO



World's Largest Builder of a Complete Line of Lathes . . . For More than 68 Years



gives driving smoothness to boring mill table

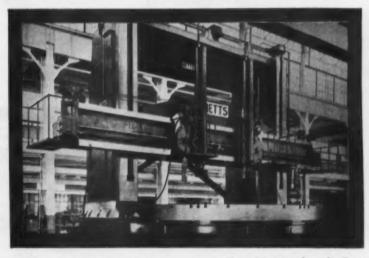
The huge single-helical ring gear built into this twenty-foot boring mill table is an important factor in obtaining an extremely fine finish on work turned on the mill.

Designed to impart driving smoothness to the table, both the gear and its mating pinion are precision generated by Farrel to a high degree of accuracy, and carefully fitted to eliminate the possibility of backlash. The pinion shaft is worm driven and this, together with the wide-angle helical gear, provides a smooth, chatter-free drive.

The gear, which is split, has a 30° right-hand helix angle, 276 teeth, 1½ DP. Its inside diameter is 183.294" and the face is 9¾" wide.

Farrel precision-generated internal gears are available with either helical or spur teeth in sizes up to 16 feet diameter, 12 inch face, 3/4 DP. They are made of the finest grade materials.

Farrel engineers will be glad to assist you in working out unusual gear problems. Why not call on them?



FARREL-BIRMINGHAM COMPANY, INC. ANSONIA, CONNECTICUT

Plants: Ansonia und Derby, Conn., Buffale and Rochester, N. Y. Sales Offices: Ansonia, Buffalo, New York, Beston, Akron, Detroit, Chicago, Memphis, Minneupolis, Fayetteville (N. C.), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans The table is used on this Betts boring mill, made by Consolidated Machine Tool Corporation, Rochester, N. Y.

FB-940

Farrel-Birmingham



ASSEMBLY STRENGTH

The "proving ground" for the holding power of P-K Socket Screws is industry-wide. Millions of assemblies made by thousands of satisfied customers are your assurance that screws made to P-K quality standards meet every test.

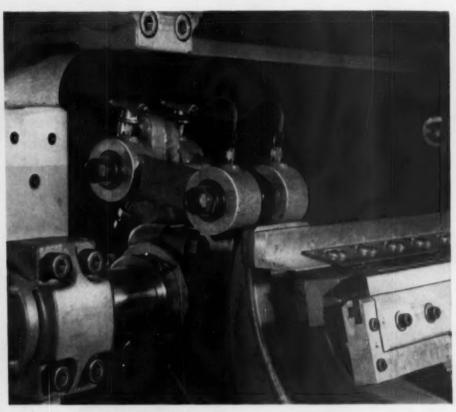
In many of these assemblies, P-K Socket Screws are subjected to extreme conditions of shock and vibration . . . such as ordnance and other products made to exacting demands of the Armed Forces.

Get samples, information from your P-K Distributor, or write: Parker Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.



Used by thousands of cost-wise buyers in millions of assemblies . . . to

make planned savings pay off



STAY TIGHT UNDER TOUGHEST CONDITIONS

In the warp knitting machine, above, P-K Socket Screws stay tight under constant vibration. Some of many different P-K Socket Screws used are shown — P-K Cap Screws in shaft bearing pads and needle bar clamps, and P-K Set Screw in collar on needle bar rocker shaft.

For ALL essentials of cost-wise assembly get P-K Socket Screws

FOR ADVANCED DESIGN that speeds assemblies—makes them simpler, stronger—and saves errors.

FOR TOP QUALITY and tolerance gaged to your most exacting specifications — and guaranteed.

FOR ASSEMBLY STRENGTH okayed in a million punishing tests by thousands of satisfied users.

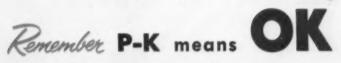
FOR PLANNING AIDS and buying data patterned to your special needs, plus advice on assembly.

FOR SUPPLY SERVICE set up for fast action and lower purchasing expense — by local Distributors.

SOCKET SCREWS

SET CAP FLAT HEAD BUTTON HEAD SHOULDER PIPE PLUO

Call your nearby P-K Socket Screw Distributor



FERRACUTE INCLINABLE
ON YOUR PRODUCTION LINE

BUILT TO JIC STANDARDS

With air-powered, electrically controlled "L.K." style FRICTION CLUTCH with interconnected brake and single-point adjustment

and box-type ram

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Complete specifications on
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LINE OF OPEN-BACK
INCLINABLE PRESSES
110-Ton 150-Ton 200-Ton

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FERRACUTE MACHINE COMPANY

Since 1863 Builders of Power Presses, Press Brakes and Special Machinery, Bridgeton, N. J., U.S.A.

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SOCKET SCREW PRODUCTS

always measure up!



Socket screw users who want what they want when they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products always measure up.

Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.

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> THE BRIGHTON SCREW & MANUFACTURING CO.

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THE FERRY CAP

countr-bor

SCREW

12-POINT HEAD

A NEW, REVOLUTIONARY DESIGN FOR SOCKET HEAD SCREW APPLICATIONS



OFFERING THESE HOTEWORTHY ADVANTAGES:

- Litakes standard 12-point
- 2 External wronching instead of internal.
- 3. Stronger-mere gripping surface.
- A.Permits greater wronching torque.

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In brief—a quality product which will do everything required of socket head screws—and more. For all counterbore applications.

Wherever the Ferry Cap Countr-Bor Screw has been tried, users are enthusiastic—saying that these screws are a service man's dream and the best development in socket screws in recent years. They will help you lick tough assembly problems where socket screws are required.

We shall be glad to send samples, prices and complete information promptly upon request.

Ferry Cap Countr-Bor Screws
PATENT APPLED FOR
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THE FERRY CAP & SET SCREW COMPANY

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MINSTER

First in Press Design

MATTER OF RECORD

A few of the Minster FIRSTS in Press Design

1937-Patented Minster Combination Air Operated Friction Clutch and Brake Unit.

1937-Full Box Type Crown and press construction.

FIRST-To offer Box construction in

large "C" frames and slides. 1938-Barrel Type Slide Adjustment.

FIRST-With recirculating oil lubri. cation on presses.

1946-Combination Air Friction Clutch and Brake mounted on crankshaft in either flywheel or main gear and hav. ing controlled torque.

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MINSTER FIRSTS

at the

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THE MINSTER COMPANY

MINSTER, OHIO



TO BENEFIT USERS OF ALL SANDVIK PRODUCTS

The new Sandvik building provides modern, expanded facilities for the administrative, production and Eastern Warehouse operations of the main company and all divisions, including:

SANDVIK-COROMANT

Carbide Tipped Tools, Blanks and Inserts.
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Power springs for watches, instruments, office machines and other industrial uses.

SANDVIK STEEL BELT CONVEYORS

Cold rolled Carbon and Stainless Steel Belt Conveyors for Material Handling and Processing.

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High Quality Swedish Hardware, Tools and Specialties.

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For applications which require HIGH FATIGUE LIFE, FINE SURFACE FINISH, ACCURATE & UNIFORM GAUGE specify SANDVIK cold rolled specialty strip steels.

You can get Sandvik strip steels:

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Ask your nearest Sandvik office for further information or technical assistance.

Sandvik Swedish Specialty Strip Steels are used for Toxtile Machine Parts such as sinkers, needles, etc. . Band Saws (metal, wood and butcher) . Camera Shutters . Clock and Watch Springs . Compressor Valves . Doctor Blades . Feeler Gauges . Knives such as cigarette knives, surgical, etc. • Razor Blades • Shock Absorbers • A Wide Variety of Springs • Trowels . Reeds: Vibrator, Textile, etc. . Piston Ring Segment and Expanders * and many other applications.

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In this new relay, each pole is contained in its own melamine housing, and any individual pole can be removed or replaced from the front without disany individual pole can be removed or replaced from the front without disturbing the others. A short circuit is confined to a single pole and will not destroy the whole relay. Wiring terminals are on the front, and all maintenance including coil changing, pole or magnet replacement, is also from the front—without removing relay from panel. Contacts are quickly and easily convertible from normally open to normally closed and vice versa—from the front. Range of models provides relays with 2 to 12 poles. Exclusive design allows more contacts per square foot of panel space. In addition to the many advantages of SECTIONAL POLE CONSTRUCTION, you get a heavy-duty relay in small space.

SEE THIS NEW RELAY AT THE CLARK EXHIBIT, PRODUCTION ENGINEERING SHOW, BOOTH 840 Navy Pier, Chicago — September 6-16, 1955

AT THE NAVY PIER

Production Engineering Show

New

See the NEW BOSTON GEAR Speed Reducers



Designed by Boston Gear specialists to deliver

Certified

MAXIMUM HORSEPOWER
PER DOLLAR

by Independent Laboratory tests

Every feature you want - any model you need

NEW space saving design NEW clean contours NEW gearing efficiency NEW cooling fins FAN COOLING optional on larger sizes

New

RATIOMOTORS

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Gear reduction unit and easily detachable standard end-mounted motor — combined for big maintenance savings. Permits (1) replacement of motor without disturbing gear unit, (2) replacement of original motor at any time with motor of special characteristics (totally-enclosed, etc.)



New FLANGED REDUCTORS

The Ratio motor gear reduction unit, supplied without motor. You buy and attach the motor of your own choice.



Harizontal Right Angle Drive Worm gear on top



Horizontal Right Angle Drive Worm gear under



Vertical Right Angle Drive



Horizontal Parallel Drive Double Reduction



Vertical Right Angle Drive
Double Reduction



Horizontal Right Angle Ratiomator



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Vertical Right Angle Ratiomotor



Vertical Right Angle Ratiomotor Double Reduction

PATENTS PENDING

108 MODELS 1064 STANDARD STOCK UNITS

Get your copy of NEW CATALOG R-56 for specifications and selection data

CALL YOUR

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for complete information — or write Boston Gear Works, 72 Hayward St., Quincy 71, Mass.

Look under "GEARS" in the Yellow Classified Section of your Telephone Directory for the BOSTON Gear Distributor nearest you.

558G-MTS-14





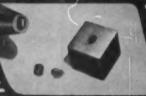
and glazed porcelain in which three round and one square cavities were



H.SS. lockwasher die blank, die and the tool which produced it

......





Nothing is too HARD to be Machined by

Sheffield's

hardest materials are machined readily.

accurately and economically. And without regard for their electrical characteristics.

Because no heat is generated by the machining process no change is produced in physical properties of the material machined.

Cavitren is designed and built by the Sheffield Corporation which has been manufacturing precision tools for 50 years. In Cavitron you get the accuracy, rigidity and ease of control charactoristic of the highest American Standards.

MACHINABLE MATERIALS

Hardened tool steel Cemented carbides

Ferrite-Germanium

Cermets—ceramics—glass Aluminum oxide

Precious stones—quartz

MACHINING OPERATIONS

Drilling-boring

Contouring-Engraving Slicing and dicing

Tapping

PRODUCTS PRODUCED

Dies, steel and carbide

Machine and motor

Electrical and electronic components

Jewell bearings-tools

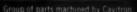
Tire molds-carbide

Have a Sheffield engineer show you in your own office the recent soundslide film "Machining the Unmachinable." Here is Cavitron in operation. Write to Div. 810-THE SHEFFIELD CORPORATION, Dayton 1, Ohio, U.S.A.

See us of the chine Tool Show, Seeth 1305



Group of Cavitron machines







7224



ALL-MAGNESIUM F-80C jet fighter promises huge savings to taxpayers.

Magnesium plane breaks through cost barrier!

Also faster, stronger, and simpler to produce.

You're looking at an experimental model of the USAF's famous F-8oC jet fighter, built by Barium's East Coast Aeronautics, Inc., Pelham Manor, N. Y.

It doesn't look any different from other F-8oC's-but the entire airframe is magnesium. Using this light but strong metal as structural material eliminated over 60% of the parts and fastenings originally required by the aluminum design.

Using fewer parts and fasteners not only saves material costs, but also reduces the cost of man hours for engineering, parts fabrication and assembly, and the

design and manufacture of tools. And the magnesium plane is faster, stronger, and simpler to produce.

This impressive technical accomplishment by East Coast Aeronautics highlights again the hard-thinking, hard-working management and production team that has built Barium from a single company to 16 in only 10 years. And this alert organization produces a tremendously varied list of products - from massive steel bridge girders to plastic seats. You're invited to find out more about Barium's soundly diversified family of companies. Write for the Barium story. Barium Steel Corporation, 25 Broad Street, New York 4, New York.



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Chester Blast Furnace (pig iron) • Central Iron and Steel Company • Phoenix Iron & Steel Co.

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Lightweight Metal and Plastics

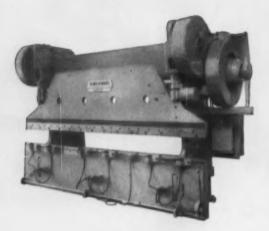
East Coast Aeronautics, Inc.



Important Announcement

to the

Metal Working Industry

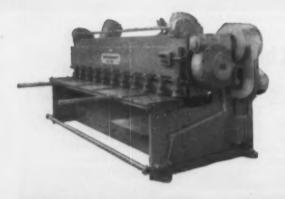


The Cincinnati Shaper Company

announces a

5 Year Guarantee

on material and workmanship on all new machines shipped after September 1, 1955. This guarantee is evidence of the unusual dependability of our machines.



THE CINCINNATI SHAPER CO.

CINCINNATI 25 OHIO USA

SHAPERS . SHEARS . BRAKE





Power aplenty 'til the pond ran dry

That was the complaint in the days of water-wheel power-and still is today.

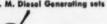
In every season, water shortages force large areas to curtail power usage . . . storms tear up vast power networks . . . solid fuel shortages bring with them power rationing.

In many cases, a single power failure can cost you more than the installed price of a dependable Fairbanks-Morse Diesel Generating Set! In addition, there are

day-to-day savings with in-plant power: eliminate power factor penalties, add to current capacity as load increases, reduce peak demand values for lower purchased power rates, and often lower insurance rates.

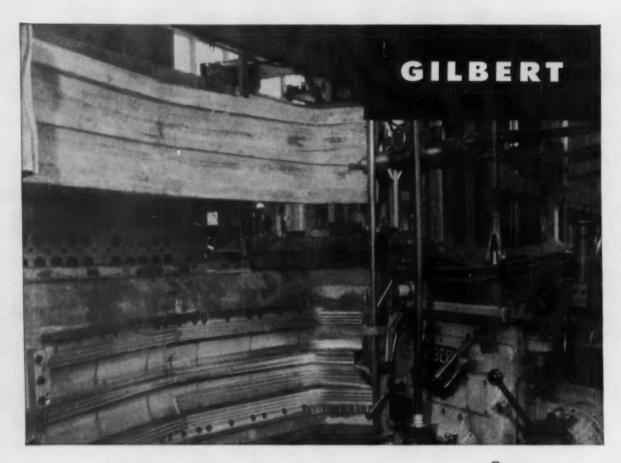
> We'll gladly send you more information or survey your plant's power requirements without obligation. Why not find out about In-Plant power generation today-before power fails you?

Fairbanks, Morse & Co., Chicago 5, Ill.



FAIRBANKS-MORSE
a name worth remembering when you want the best

DIESEL AND DUAL FUEL ENGINES - DIESEL LOCOMOTIVES - BAIL CARS - BLECTRICAL MACHINERY - PUMPS - SCALES - HOME WATER SERVICE EQUIPMENT - MOWERS - MAGNETOS



add reverse curves to your machining pitch



"The Gilbert revolving column boring mills, together with the very accurate Goodrich follower, make possible the machining of deep cavity, steep side dies complete in one position of the work piece.

"It is also possible to machine cupped ends or reverse curves without having to move the job."

These are the words of Mr. Ed Miller, President of the Lansing Tool & Die Company, Lansing, Mich. With his two Cincinnati Gilbert Floor Type boring

mills, he has offered customers machining services which couldn't be done on any other horizontal mills. Other equipment capable of doing these jobs costs several times more than the Gilberts,

For profiling and duplicating, a Gilbert offers you quick profits on a low investment. Bulletin 954 contains full descriptions and specifications. Write for it today. The Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, Ohio.



those who buy Gilbert buy GILBERT again



Performance Proves

20% to 90%

LESS VIBRATION

with Veelos—the Balanced V-belt

Engineers have long known that there are four principal causes of machine vibration: 1. bearings; 2. motor; 3. clutch; 4. sheaves. Often overlooked is a fifth cause: v-belts alone are the major cause of vibration.

There's a logical reason for this.

Regular v-belts have spots of varying density due to their construction. Normally, these spots are not apparent, yet they throw the belt out of balance when the drive is operating. As a result, vibration is created that can damage bearings, shafts and, most important, the finished work.

This is not true of Veelos v-belts.

Veelos is absolutely uniform throughout its entire length. Every link and

every stud is identical. The smooth, machine-cut sides and the laminated construction assure smooth, vibrationless power delivery. Veelos is perfectly balanced.

In case after case, installation of Veelos v-belts has reduced machine vibration 20% to 90%.

Proof that Veelos will reduce vibration can easily be demonstrated with an electronic vibration analyser. This analyser measures amplitude of vibration to as low as 2-millionths of an inch.

Fifteen minutes of your time is all that is required to show you with the electronic analyser that Veclos creates less machine vibration. Drop us a line or clip the coupon for a demonstration.





Manheim Manufacturing & Beiting Company 453 Manbel St., Manheim, Pa.

Yes, I would like a demonstration. Have your representative call me for a convenient time.

ADJUSTABLE TO ANY LENGTH . ADAPTABLE TO ANY DRIVE

Veeles is known as Veelink outside the United States.

267

metalworking history will be made by

NIAGARA PRESSES, PRESS BRAKES

in action!

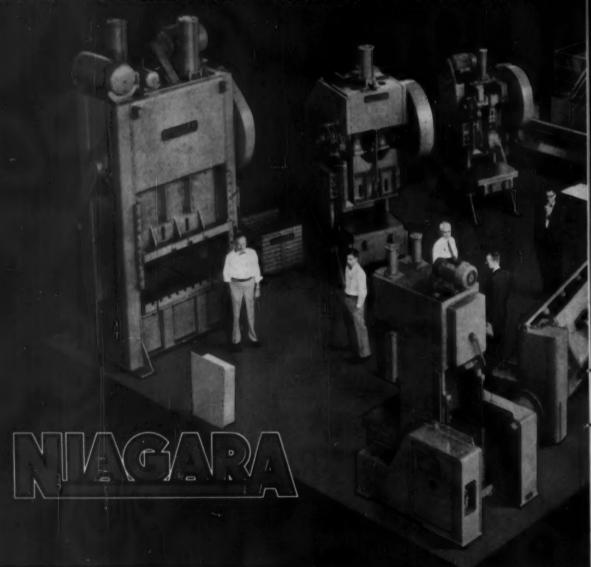
Watch them operate. Examine them. See a revolution in metalworking with these modern wonders in action. You'll be electrified by brand new machines never before exhibited, stirring new developments on conventional machines and engineering marvels in press automation.

Truly, Niagara promises you the greatest demonstration of the word "New" in the whole Machine Tool Show.

And everybody — yes, everybody — top management and all — will be on hand to give you a warm greeting and a full explanation of anything you wish to know about history-making Niagara machines. Come early, while you're fresh. There's so much to see!

NIAGARA MACHINE & TOOL WORKS

BUFFALO 11, N. Y.



AND SHEARS

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MAIN EVENT Booth No. 715

THE MACHINE TOOL SHOW

CHICAGO, ILL. BEPT 8-17, 1955 INTERNATIONAL AMPHITHEATER



NEW DESIGNS

NEW LINES

NEW COMPACTNES

NEW STAMINA

NEW ECONOMIES

NEW ACCURACY

NEW OPERATING EASE

NEW SAFETY

NEW CAPACITIES

NEW PRODUCTIVITY

THE PRECISION

THE MACHINE TOOL SHOW



AT THE SHOW ... SOOTH 1416

developments in The Precision Line of Fellows Gear Production Equipment. If you don't make it to the Show ... then it will pay you to contact your nearby Fellows Office for the latest facts.

THE FELLOWS GEAR SHAPER COMPANY, Head Office and Export Department: 78 River Street, Springfield, Vermont. Branch Offices: 319 Fisher Building, Detroit 2; 5835 West North Avenue, Chicago 39; 2206 Empire State Building, New York 1; 6214 West Manchester Avenue, Los Angeles 45.

FELLOWS Gear Production Equipment

LINE

COLLECT IT

AS IT ACCUMULATES — SOLIDS, POWDERS, SLUDGE, LIQUIDS RAW MATERIALS, FINISHED PRODUCTS, WASTE MATERIALS



Meavy waste is dumped into an open container at a foundry in New York. The first step in the COAD LUGGER SYSTEM of materials handling is to place a number of containers at strategic points to collect material as it accumulates, reducing handling at the point of origin.



Light material accumulates in an open container with high sides at a shipping carton plant in Levisiane. Rugged LOAD LUGGER containers are built of welded steel, have deep leak-proof bottoms, hold from 1½ to 14 cubic yards and more, and handle all types of material.



It is easy to load this 14-cubic-yard LOAD LUGGER centainer of a St. Louis centract hauter. It fills to the top without raking and is wind-proof and ratproof. A model with rubber seels and latches is also theft-proof, fly-proof, dust-proof, and almost adder-proof.

PICK IT UP

ALREADY LOADED -- NO LOST TIME AND NO LOADING CREWS
LET ONE TRUCK AND DRIVER DO IT ALL -- REPLACING MANY



A full container is picked up at a refluery in Indiana. The second step in the LOAD LUGGER SYSTEM is for one driver and his truck equipped with a haist-body to pick up full containers on a regular schedule. This procedure does away with loat time and loading crews and eliminates the need for several conventional trucks and their drivers.



A bearing manufacturer in Ohio picks up a full container of dolomite. LOAD LUGGER holal-bodies (Mat-bed truck bodies with a pair of hydraulic-powered holating arms) handle pay loads of up to 18,000 pounds and more. They are easily mounted on any truck chassis of suitable capacity, and all controls are installed in the cab.



An open container used for occumulating industrial wastes is picked up by a Chicago contract hauler. For greater safety, LOAD LUGGER hoist-bodies lift containers with four-point suspension and have double-acting hydraulic cylinders for positive control at all times.

LOAD LUGGER

- . FLAT-BED TRUCK BODIES WITH HYDRAULIC HOISTING ARMS
 - . LEAK-PROOF TILT-DUMP CONTAINERS FOR BULK MATERIALS



HAUL IT

IN MANY TYPES OF CONTAINERS — OR ON THE TRUCK BED IN PLANT AND OVER THE ROAD — ON YOUR TRUCK CHASSIS



A city truck in Ohio havis a full container of repair materials. Government approval is evidenced by the many such municipal, state, and federal installations. Mauling full containers is the third step in the LOAD LUGGER SYSTEM, and over-the-road havis are as feasible as in-plant because of the use of standard truck chassis.



A full container of residue materials is hauled at a corn products processing plant in Illinois. LOAD LUGGER hoist-hodies carry containers well forward for correct load distribution and cradle them between steel sidewalls for greater travel safety.



LOAD LUGGER hoist-bodies also carry materials or equipment directly an their flat bods, loading and unloading heavy objects with their hoisting arms. This special hoist-body of a Michigan telephone company transports heavy cable reess, such new uses for LOAD LUGGER equipment are constantly being developed.

ENGINEERED, MANUFACTURED, AND MARKETED BY BROOKS EQUIPMENT & MFG. CO., SUBSIDIARY OF

BORG-WARNER

CORPORATION - DISTRIBUTED INTERNATIONALLY

DUMP IT

BY TILTING CONTAINER VERTICALLY OVER REAR APRON, OR DELIVER IT BY EXCHANGING FULL CONTAINER FOR AN EMPTY



Spent solvents are dumped into incinerator tank at a drugs and medicines manufacturing plant in Michigan, Delivering full containers or dumping their loads is the fourth step in the LOAD LUGGER SYSTEM. Returning empty containers then completes the cycle.



Metal scrap is dumped and spread in the yards of a scrap metals service company in lowe. LOAD LUGGER hoist-bodies handle more pay load on a given truck chassis, because they are lighter than comparable equipment. And their patented simplicity, clean design, and sturdy construction make them cost less to buy and maintain.



Equipment of a Alami contract hauler in the dumping position. The LOAD LUGGER hoist-body has outrigger jacks to protect rear springs and asles from injury while picking up and putting down heavily loaded containers, but it neither needs nor uses these jacks while tilting container over rear apron to dump or spread the loads.

For more information mell this caupen to: 2065 Devenport Rd., Knoxville, Tann.

Home and position

Home of company

Street address

City, zone, stote



NEWBRITAIN

Automatics

See the newest approaches to

Automatic Bar and Chucking Machines; Precision Boring Machines; Copying Lathes; Horizontal Boring, Drilling, and Milling Machines.

The NEW BRITAIN MACHINE COMPANY



more profitable metalworking



BOOTH 1419 THE MACHINE TOOL SHOW

> CHICAGO, ILL. SEPT. 6-17, 1955

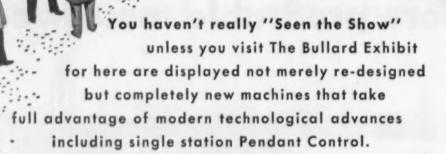
INTERNATIONAL AMPHITHEATRE



New Britain-Gridley Machine Division, New Britain, Connecticut Lucas Machine Division, Cleveland 8, Ohio

Be sure to see

Coday's MOST MODERN Line of MACHINE TOOLS



Don't Miss It!



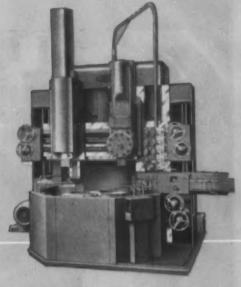
The Bullard Co.

Bridgeport 2, Connecticut



THE MACHINE TOOL SHOW

CHICAGO, ILL. SEPT. 6-17, 1955 STEENATIONAL AMPHITHEATE

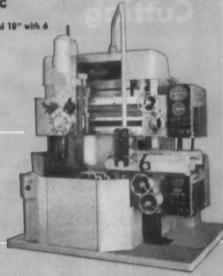


CUT MASTER V.T.L.

In six sizes, 26" to 76" table diameters in 10" increments. Various combinations of heads are available.

MULT-AU-MATIC

10" with 6, 8, 12 or 16 spindles, 14" and 18" with 6 or 8 spindles. Automatic loader.



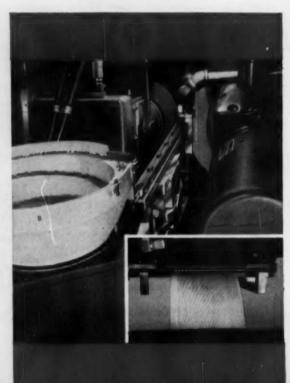
MAN-AU-TROL Model 75

For fully automatic operation — may be applied to any or all heads of Cut Muster V.T.L., Model 75 at time of ordering or in your plant at a later date.

HORIZONTAL BORING, MILLING and DRILLING MACHINE

3" 4" and 5" spindle — Available in many combinations of bad lengths, vertical capacity and table size, Automatic positioning.





Cutting

Workpiece:

Thread Spec .: Diameter Length -

> Type Tolerance

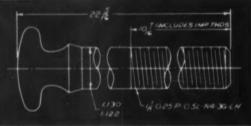
Threading Time:

Valve Stem

141/8"

10-7/16" 1/4"P, 1/2" lead, double left-hand Acme Class 3

24 sec.



Threading is by the <u>new</u> 16C LANDMACO Single-Spindle Leadscrew Threading Machine fitted with 2" LANCO Heat-Treated Head using Roughing and Finishing Chasers with Centering Throats. This equipment is designed to produce a thread of excellent finish despite heavy metal removal, and eliminate the out-of-roundness common in long workpieces. Long life between grinds of the LANDIS Tangential Chasers for 80%, of their length will hold tool cost to a minimum.

Grinding

Workpiece:

Thread Spec .: Thread length

Production:

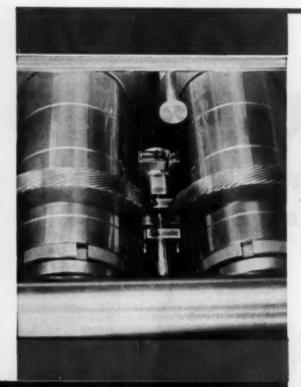
Set Screw

7,500 pieces per hour



Threading is performed by continuous thru-feed grinding on a #1 LANDIS Centerless Thread Grinder. Operation is automatic— blanks are fed by a vibratory hopper—finished pieces ejected into a tray. This operation in-dicates the mass production possibilities of the centerless thread grinding method. Infeed grinding may be used for many shouldered workpieces which may not be threaded satis-factorily by either Cutting or Rolling.

443-C



THE MACHINE TOOL SHOW BOOTH 1406

Rolling

Workpiece:

Worm shaft (50 carbon alloy steel of 25 Rockwell C)

Thread Spec .: Diameter

Length Type

Triple worm, .100" P. .300" lead .003 concen. with main

Tolerance

bearing journals 12 pieces per minute

Production:



Threading is done by infeed rolling with manual loading on the new LANHYROL Thread Rolling Machine. This operation illustrates the difficult threads which can be rolled. Automatic feeding is available for many operations—thrufeed rolling of Acme Threads on long bars also to be demonstrated.

CUTTING, GRINDING, AND ROLL-ING THREADS will be demonstrated on the most modern Threading Equipment. 3 of the more than 10 Threading Operations to be shown are illustrated. All of the Threading Machines featured in these operations will be on display for the first time: the LANHY-ROL Thread Rolling Machine, the Model C LANDMACO Threading Machines, and the #1 Automatic Close Nipple Machine. LANDIS Threading Tools-Die Heads, Collapsible Taps, and Thread Rolling Attachments-will also be shown, Experienced LANDIS Engineers will be glad to help with any problem dealing with method, equipment, or thread design.

LANDIS Machine Company

See Cincinnati

SHAPERS...SHEARS

-in ACTION

at THE MACHINE TOOL SHOW

INTERNATIONAL AMPHITHEATRE-CHICAGO, ILL.
SEPTEMBER 6-17

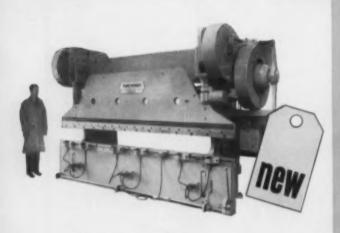
BOOTH 1105



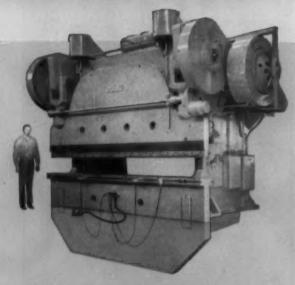
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS . SHEARS . BRAKES



9-115 x 10' CINCINNATI ALL STEEL PRESS BRAKE, capacity 1/4" x 10' mild steel.



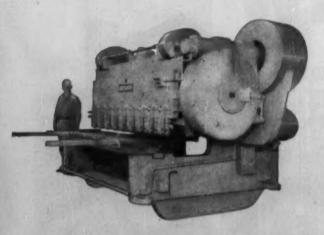
50-900 x 12' CINCINNATI ALL STEEL PRESS BRAKE, capacity 1" x 12' mild steel.



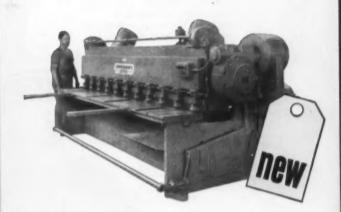
42" CINCINNATI ALL STEEL SHAPER, 16 cutting speeds, 25 to 400 FPM.



16" HEAVY DUTY CINCINNATI RIGID UNIVERSAL SHAPER.



10008 CINCINNATI ALL STEEL SHEAR, capacity $1^{\prime\prime} \times 8^{\prime}$ mild steel.



1410 CINCINNATI ALL STEEL SHEAR, capacity 3/16" x 10' mild steel.



2-30 \times 5' CINCINNATI ALL STEEL PRESS BRAKE, capacity 30 ton or 14 gauge \times 6' mild steel.



3-50 \times 6' CINCINNATI ALL STEEL PRESS BRAKE, capacity 50 ton or 10 gauge \times 6' mild steel.

To meet your needs . . . DU PONT SULFURIC ACID from our new East Chicago plant-

THE WORLD'S LARGEST SINGLE CONTACT UNIT

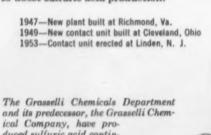
More than a trainload a week-that's the rate sulfuric acid is turned out by Grasselli Chemical Department's new contact unit at East Chicago, Indiana.

Situated to serve the industrial Midwest, it is another step in Du Pont's long-range expansion and modernization program designed to meet the steadily mounting requirements of industry for this basic chemical.

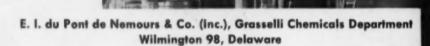
It joins other postwar moves by Grasselli to boost sulfuric acid production.

Grasselli also manufactures sulfuric acid at Ecorse, Mich.; Lockland, Cincinnati and Toledo, Ohio, and Wurtland, Ky.

Sulfuric acid from this new unit will be used primarily in the manufacture of steel, petroleum products, chemicals, insecticides, medicines, explosives, storage batteries, and synthetic detergents.



duced sulfuric acid continuously since 1839, when Eugene Ramiro Grasselli established a plant in Cincinnati, becoming the first mantoproducesulfuricacid west of the Alleghenies.



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In Canada-Du Pont Company of Canada Limited, Box 660, Montreal, P. Q.

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high carbon strip cold-rolled spring steel

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Weirton supplies spheroidized-annealed cold-rolled spring steel for operations where superior forming qualities are necessary. Simple and economical fabrication is assured by the exceptional ductility of the controlled grain structure.

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- Exceptional uniformity of gauge and width.
 Controlled decarburization limits. . . . Why not let Weirton help make your product better?
- 6



WEIRTON STEEL COMPANY

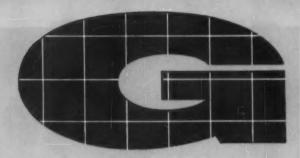
Weirton, West Virginia

NATIONAL STEEL CORPORATION



46" MACHINE ILLUSTRATED with Turret, Ram and Side Head. Wide variety of head combinations available

KING VERTICAL BORING AND



Here's the

ALL NEW

KING

VERTICAL
BORING and
TURNING
MACHINE

Completely Re-designed for:

higher productivity...
greater accuracy...
ease of control...
simplified maintenance

These new KING® machines—the result of long, intensive research and development—will bring to boring mill users the greatest productive capacity thus far achieved for vertical boring and turning work! Here are a few of the many advanced features:

INCREASED HORSEPOWER

40 to 50 h.p. on 30" to 46" sizes, 75 to 100 h.p. on sizes 56" and up.

EXPANDED FEED & SPEED RANGES

24 feeds available, 24 speeds arranged in geometric progression in any of three standard ranges.

FULL ELECTRIC CONTROL

All controls arranged for maximum operator convenience. Those most frequently used are pendant located; all others are on a fixed control station on the side head. Pendant controls include automatic pre-selective speed selector dial, speed change pushbutton, and directional pushbutton control of all head movements.

POWER SWIVELING OF RAIL HEADS

Power swiveling is pushbutton controlled from pendant and may be done at rapid traverse or feed rate.

POWER INDEXING (Optional)

Both the rail head turret and the side head tool block may be arranged for power operation controlled from the pendant.

POWER RAIL CLAMPING (Optional)

With this feature, power clamping of the rall is electrically interlocked with pushbutton-operated rail positioning.

AUTOMATIC LUBRICATION OF ALL MOVING PARTS

This feature eliminates manual operation of lubricating pumps.

New model King machines belong in your increased productivity plans. Obtain the complete story on the amazing productive capacity of these new Kings by filling out and mailing the coupon below.



See the new KING under power operation of BOOTH No. 1121

SEND NOW FOR NEW CATALOG

American Steel Foundries, King Machine Tool Division 1166 Tennessee Avenue, Cincinnati 29, Ohio

Please send Catalog K-5 illustrating and describing new model KING Vertical Boring & Turning Machines.

Catalog K-5 covers 30", 36", and 46" machines. Catalogs on larger sizes will be available later.

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THE PORTABLE HEAT PROVER is supplied and maintained free by Cities Service. It helps control combustion efficiency by allowing rapid, continuous sampling, simultaneous readings and direct measurement of oxygen and combustibles. Inland uses the Heat Prover for its blast furnaces, open hearths, soaking pits, continuous galvanizing line, reheat furnaces, purging operations, annealers, and boilers on ore ships.

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is out of this world

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The G. A. GRAY CO. Cincinnati 7, Ohio

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Planer—single cuts, double
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The new GRAY
Horizontal Boring, Drilling
and Milling Machine—brute
power and great precision
with versatility unlimited

The new GRAY Handymill at long last a powerful, rigid milling machine for the medium size job.



See these Norton machines at the Chicago show

The machines described here will be shown in the Norton exhibit at the Chicago Machine Tool Show -Booth No. 516.

These advanced machines are only a small fraction of the world's largest line. Norton produces a wide range of cylindrical, surface and tool room grinders, lapping machines, crankshaft and camshaft grinders and special types for grinding pistons, valves, jet parts, etc.
Remember, only Norton offers you such long experience

in both grinding machines and wheels to bring you the "Touch of Gold" that helps you produce more at lower cost. Why not replace your obsolete grinding and lapping equipment with new Norton machines - and meet competition with the best production tools in the field? See them at the show, call your Norton representative for full details, or write direct.

NORTON COMPANY, Machine Division, Worcester 6, Massachusetts.



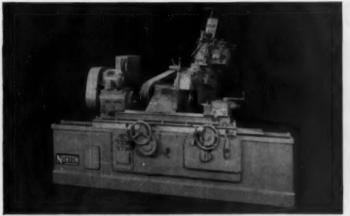
Automation in crankpin grinding . . . another Norton "FIRST"

Outstanding in the Norton exhibit at Chicago will be the Automatic Transfer Type Crankpin Grinding Machine. This Norton-engineered advancement grinds pins on automotive type crankshafts completely automatically — eliminating entirely the manual operations of loading, clamping, adjusting, controlling size, gaging and unloading. Savings of time and labor are thus built up for every pin on the shaft.

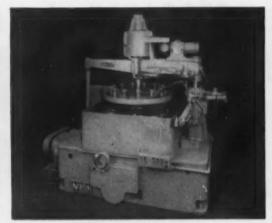
Movements of the transfer mechanism are electrically controlled, hydraulically operated and completely interlocked to control proper operating sequence.

Other Norton automated grinders are on the way. Meet

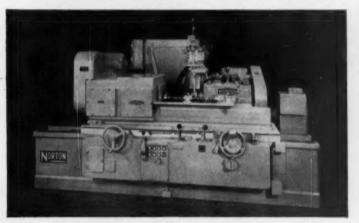
competition with the most economical modernization of grind-ing methods now available. Norton engineers will gladly dis-cuss complete or partial automation of your grinding operations



SEMIAUTOMATIC ANGULAR WHEELSLIDE GRINDER — TYPE CV-4. Grinds thrust surfaces and adjacent diameters in one fast automatic plunge grind operation. Eliminates the separate grinds necessary with conventional machines. Operator merely loads, starts automatic cycle, and unloads. Work lengths: 18", 36", 48", 72".



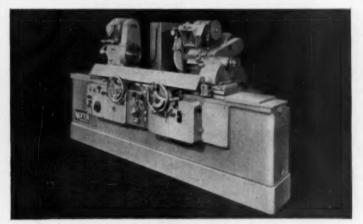
HYPROLAP* HIGH PRODUCTION LAPPING MACHINE NO. 48F. For extremely fast, high production of single or parallel face flat lapping. Bonded abrasive laps produce work pieces free of grit. Arrangements: plain, time cycle... automatic continuous feed... semiautomatic continuous feed.



CAM-O-MATIC* CAM GRINDER NO. 3. A new, highly advanced automatic machine that sets new standards for production, precision and finish. Solid construction cuts vibration, assures maximum accuracy and service life. Entire operating cycle is geared to split-second efficiency. Capacity for taper-face grinding gives added versatility.



HEAVY DUTY MULTI-WHEEL GRINDER — TYPE CM-1. Makes four or more cuts simultaneously in a single plunge-grind cycle. Operates automatically, under one-lever control. Brings new economy to the grinding of multi-diameter parts such as crank and camshafts, etc. In 10" x 30" and 14" x 30" sizes.



12" UNIVERSAL GRINDER — TYPE U-4. Quick, easy set-ups plus fast grinding action over a wide variety of external, internal, face and angular wheelslide grinding jobs. Permanent chuck mounting is one of many advanced features. Work lengths: 36" and 48".

Also shown at Chicago will be the Norton 10" Semiautomatic Cylindrical Grinder — Type CTU. Designed for plunge or traverse type operations, from rough cuts to finest finishing. Production and job shop users report one Type CTU replaces several other machines.

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The above scene is what geologists tell us Goose Lake may have looked like 250 million years ago. Today—the scene is quite different. For now, this wealth of flora and fauna is far below the earth's surface . . . an excellent source of high quality fire clay.

Proved vital since man first started melting metal, fire clay is—to this very day—ever-growing in importance to all industry. And while good fire clay is abundant, this 250 million year old deposit at Goose Lake takes on added significance: its proximity to the "heart" of midwestern industry.

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Eriez Permanent Magnets to SEPARATE...



OLD IRON PANTS AND THE MAGNET. A lady from yesterday with a metal-ribbed girdle wouldn't be safe next to an Eriez Permanent Non-electric Magnet. She might easily be "hung up" by the powerful Alnico V action. This idea of herculean power and permanent dependability now offers the metalworking industry many new ideas for separation, purification, and retrieving of ferrous material from places where it would cause machinery damage or product defects. In addition, Eriex Magnets designed to control and convey metals at high speeds have presented new concepts in plant automation.

MAGNETIC IDEAS FROM

RETRIEVE ... PURIFY

◆ Famous for years as magnetic separators to remove tramp iron from processing lines of all kinds, Eriez Permanent Non-electric Magnets have recently found widespread acceptance in the metalworking industry, where they are used to separate, retrieve and purify. In addition, Eriez Magnets especially designed for controlling and conveying purposes, move steel horizontally, vertically, or up steep inclines at such speeds as to allow peak production. Easily installed on new or existing equipment, Eriez Magnets have opened up many new ideas in plant automation, and are destined to play a major role in the metalworking industry. All Eriez Magnets are non-electric, self-contained. They have no wires or attachments. There is no operating cost; first cost is the last. Powerful Alnico V elements are guaranteed to keep their strength indefinitely.

WORKING PRODUCTION PROBLEMS

Write for big new "Magnets for Metalworking" Bulletin



ERIEZ SHEET FANNER MAGNETS. Here's the magnet to speed up sheed metal handling and increase production. Slow, costly hand separation is completely eliminated . . . no more double feeding, no scratched surfaces, no cut fingers. An Eriez Sheet Fanner Magnet placed next to a pile of sheet metal automatically lifts the top sheet into the air, allows fast, safe removal. When this sheet is removed, the following one automatically rises. Ideal for irregular, odd-shaped sheets. Available in five strengths.



ERIEZ DIP TANK MAGNETS. Here's a handy piece of magnetic equipment designed for fast, sure removal of ferrous materials from tanks, etc. Powerful, permanent magnetic bar element will snap up and hold liberal amounts of metal parts, fine iron particles, etc., from dip tanks, plating tanks, hydraulic system oil reservoirs, acid baths, vapor degreasers, heated ovens, etc. Runners make it exceptionally easy to maneuver on tank bottoms. Standard models are all-stainless steel construction with handle length up to 8 feet. Approximate weight: 16 pounds.



ERIEZ MAGNETIC AGITATOR DRUMS. Here's the unit designed to eliminate slow, costly separation of magnetic from nonmagnetic materials. Easily installed at the discharge end of spouts, screw conveyors, gravity flow chutes, etc., the powerful action of the drum's specially located Alnico V elements automatically separates the material as fast as it is fed to the drum. Ideal installation for sand blast reclamation, chip material separation, and wherever there is a high concentration of medium sized ferrous material.



ERIEZ MAGNETIC FERROUS CLEANER. Designed to magnetically remove fine iron contamination from liquids, the Eriez Ferrous Cleaner is a lightweight, portable non-electric separator that can be placed at more than one convenient place in a processing line. Thin flows of powder can also be cleaned of iron if the unit is used in conjunction with a vibrating feeder. Adjustable gate controls the rate of feed onto the chute and magnetic grid. Removable grid with 124 magnetic fingers is easily cleaned. Effectively prevents rust spots and product spoilage.

Eries "Magnetic Ideas" can help you. Eries factory-trained field men, backed by extensive laboratory and engineering know-how, will be happy to study your particular metal handling problem and offer helpful "Magnetic Ideas". Our representatives are always glad to work with your engineering department or consulting engineers on any problem, large or small. For additional information concerning magnetic problems in the metalworking industry, write for new bulletin B-207. Address Eries Manufacturing Company, 100V Magnet Drive, Erie, Pennsylvania.

Wherever you look AT THE MACHINE TOOL SHOW YOU'LL FIND



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The Cleveland Automatic Machine Co. - BOOTH #412



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Famco Machine Company BOOTH #507

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The Fosdick Machine Tool Co. BOOTH \$1402





Company — BOOTH #906

GREAVES

Greaves Machine Tool (



speeds installation of any machinery protects accuracy of precision machines

These machine tool builders cut set-up time at the Machine Tool Show from hours to minutes with BARRYMOUNT® Leveling Isolators. No drilling floors, no setting lag bolts, no shimming — they just set their machines on the Barry mounts, adjusted the leveling screws, and the normally tedious, costly job was done.

This is not just a show trick — it's a standard efficiency procedure for new installations and re-installations in large and small plants all over the country. And, at the show or in your plant, the isolation built into Barry mounts protects precision machines against vibration from nearby heavy equipment.

Visit us at Booth 153, Production Engineering Show; and a Barry engineer will show you how you can simplify installation, protect machine accuracy, prolong machine life, and cut maintenance costs with Barry Machine Mounts.

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The Motch & Merryweather Machinery Co. -- 800TH #606



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Van Norman Company BOOTH #905

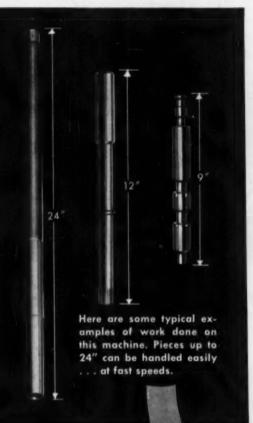
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BOOTH 21420

THE IRON AGE

at the Machine Tool Show... Booth 1221

SEE THE GREENLEE SIX-SPINDLE BAR



AIR-FEED AUTOMATIC

OPERATING WITH

Air-Feed Stock Reel . . .

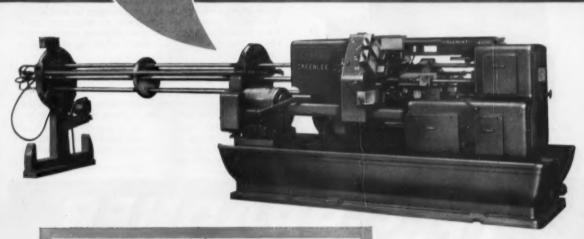
Lead Screw Threading . . .

Thread Rolling . . .

and a complement of standard tooling attachments.

The air-feed machine can be modified to handle long parts as shown at left.







GREENLEE BROS. & CO. 1808 Mason Ave. Rockford, Illinois

WRITE FOR COMPLETE INFORMATION



MACHINES THAT THINK FOR THEMSELVES

C. L. E.S.

ENGINEERED AND DESIGNED BY THE LEES-BRADNER CO. CLEVELAND 11, OHIO



TYPICAL PERFORMANCE DATA

315" diameter, 3 start hob Runs at 200 RPM Feeds at ,050" per revolution Hobs two pieces per load Hobs two gears every 4 minutes 47 teeth in gears Face width of gear %" Loading and unloading time 2 seconds

THE MACHINE TOOL SHOW CHICAGO, ILL. SEPT. 10-17, 1958
INTERNATIONAL AREALITETETT

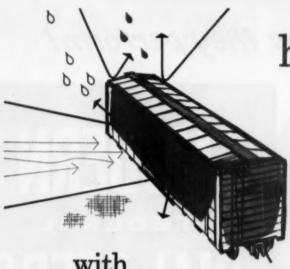
Here is your chance to see Automotion in action. The amazing machine that seems to think for itself. Lees-Bradner presents the gear hobbing machine that electronically corrects tolerances while the machine is in operation.

The "Electronic Brain" checks the finished gears as they come from the hobber and makes corrections in pitch diameters or root fillets by shifting the hob between cycles.

This revolutionary hobber is the reason we say "get the pitch on Automotion". . . the ultimate in efficient, time-saving hobbing.

Don't forget-Booth 1212 at the Machine Tool Show. Or, contact your Lees-Bradner representative who has the "pitch" on Automotion.

LEES-BRADNER



how to rust-proof a freight-car

FERRO-PAK

by Cromwell

A leading wire manufacturer discovered this economical, easy way to use Cromwell Ferro-Pak VCI Paper to insure rust-free shipping of bright finished wire. Wire coils are shrouded with sheets of Ferro-Pak and the paper is used to line the sides of the car as well. Chemical vapors travel outward from both sides of the paper, forming an invisible protective film around the wire that doesn't give rust a chance to get a foothold. Non-toxic Ferro-Pak vapors are effective almost indefinitely under most conditions.

Think how this clean, fast, easy rust preventive method

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For an interesting brochure on how you can cut costs with Ferro-Pak in packaging, shipping, storage and maintenance, write on your letterhead today.

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modern presses will also perform many of the specialized operations that are unique to your particular plant. Automation is today's watchword! Modernize now with Federals and watch your production go up, and costs go down. Surveys reveal many a Federal Dial Feed doing 3 to 5 times the work of a standard press-reducing accidents, cutting down-time, eliminating expensive equipment of limited use. These rugged, precisionbuilt presses incorporate the finest materials and workmanship. Available in eight sizes, from 6 to 80 tons. Automatic feeds and ejectors, if desired.

Wiring

Write for new Dial Feed catalog.

THE FEDERAL PRESS COMPANY 502 Division Street, Elkhart, Indiana

FEDERAL PLAN PRESSES

No. 7 Dial Feed-

30 Years of Quality Constru See us at the Machine Tool Show — Sept. 6-17 — Booth 801

from "Royal Water"

to Rocket Motors

Nitric Acid is as modern as tomorrow...yet ancient as alchemy. Today, its fuming forms have a vital role as oxidants for rocket propulsion. Yesterday, it was part of the ancients' gold-dissolving "royal water."

And, across the breadth of present-day industry, it serves in a host of ways...in metals and metallurgy, engraving, explosives, nitrations, etc.

FOR ALL YOUR NEEDS SEE GENERAL CHEMICAL

For over 50 years, General Chemical has been one of the nation's leading producers of nitric acid in all its forms . . . for every type of application. It was first to develop the special fuming nitrics which have come into prominence in the rocket research program; currently General offers the widest selection of grades and strengths on the market. That's why we say—for all your nitric needs from a carboy to a carload—just phone or write any General Chemical office listed below.

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Available Grades Include:

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Basic Chemicals for American Industry



BOOTHS 410 and 411 at the NAVY PIER

See the completeness and diversification of the Kennametal line of sintered carbide tooling, which includes several thousand individual items available from stock at all times to help you do a better job on any type of machining operation . . . to help you cut tooling costs, step up production, reduce machine downtime.

BOOTH 123, North Hall INTERNATIONAL AMPHITHEATRE

Let us demonstrate the best techniques in grinding carbide tooling, at our service booth, as we recondition Kennametal tools used for demonstrations by machine tool builders during the show.

And we'll be glad to discuss your machining problems and how Kennametal can help you solve them.

Drop in at both booths... and be sure to get information about K21, the new Kennametal composition that is outperforming all other General Purpose Steel Cutting Grades. Kennametal Inc., Latrobe, Pennsylvania.

*Registered Trademark

Most complete line of carbide tooling

Kennametal makes available top quality sintered carbide inserts, brazed tools, button tools, clamp tools and accessories, with cutting edges in diversified grades of hardness, toughness, heat and corrosion resistance and other properties. Write for a copy of Kennametal Catalog 55 and of Characteristics Book B-111.

Give your machines the tools they deserve ...the BEST

Be sure to see the complete line of Kendex* Butten Tools and K21... the New, Superior General Purpose Steel Cutting Grade





Curtain going up...

... on the WORLD'S BEST INVESTMENT in action



THERE WILL BE PLENTY OF ACTION AND EXCITEMENT AT MATIONAL ACME COMPANY

EXHIBITS DURING THE MACHINE TOOL SHOW. STOP IN. SEE THE WORLD'S

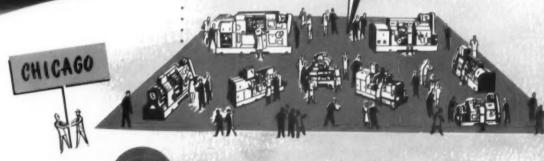
EXHIBITS DURING THE MACHINE TOOL SHOW. STOP IN. SEE THE WORLD'S

MOST COMPLETE LINE OF BAR AND CHUCKING AUTOMATICS (BOTH

MULTIPLES AND SINGLE SPINDLES) ESTABLISHING THE STANDARDS OF

MULTIPLES AND FOR FUTURE MACHINING PRODUCTION.

705



also check in at

324

for equipment to reduce threading costs and for electrical components to assure dependable automatic

See how time is saved on ACME-GRIDLEYS ... at the Machine Tool Show

ROOTH

SEPTEMBER 6 THROUGH 17

See in action 8 of the world's most versatile and productive multiple and single spindle automatics tooled up on parts such as you are now making or may make tomorrow. These Acme-Gridleys are tooled with carbides, high speed, or a combination of both — depending on the individual job analysis. Compare these speeds with your present methods. If you are not now using Acme-Gridleys, we think you'll get a new conception of metal turning production.



12-inch, Single Spindle ACME-GRIDLEY Chuck Type Fully Automatic Turret Lathe



FINGER HOLDER — First Operation

MATERIAL-1020 Stool forging

MACHINE TIME-5 minutes

NO. OF OPERATIONS-11, Inch topping 5"-16 with circulator collapsing tap. Carbide ag on all operations except

NOTE-Second operation Chuck-Matic (See below).

CYLINDRICAL IRON PULLEY

MACHINE TIME-49 seconds

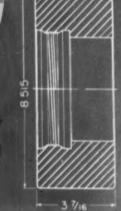
NO. Of OPERATIONS—26; 13 in each end, using carbide tool-g all the way



8-inch, 8-Spindle ACME-GRIDLEY **Chucking Automatic**



12-inch, Single Spindle ACME-GRIDLEY Chucker (CHUCK-MATIC)



FINGER HOLDER - Second Operation

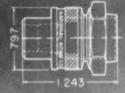
MATSRIAL-1020 Steel Forging

MACHINE TIME-1 minute, 40 seconds

D. OF OPERATIONS-S, using carbide tealing

1 1/4 -inch, 8-Spindle ACME-GRIDLEY **Bor Automotic**





SPARK PLUG SHELL

MATERIAL - Steel - Open Hearth, Grade A

MACHINE TIME-4.5 seconds; gross production, SOC places per hour

NO. OF OPERATIONS—16, using a combination of carbide and high-speed steel tools as best wits each operation.

5 1/4 -inch. 6-Spindle ACME-GRIDLEY **Hydraulic Chucking** Automatic



1-inch, 6-Spindle ACME-GRIDLEY Bor Automotic

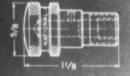


HOUSING CAP

MATERIAL-Bronze Casting

MACHINE TIME-8 seconds

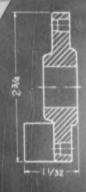
NO. OF OPERATIONS — 11, with combination of carbide and high speed steel teeling, as determined by job analysis.



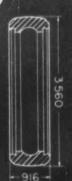
RETAINING SCREW

MATERIAL-Commercial Brass

MACHINE TIME—1.78 seconds; gross production, 2000 pieces per hour



NO. OF OPERATIONS—11, including tapping, threading and spindle stopped for cross drilling.



BEARING RACE

Two places produced simultaneously

MATERIAL-52100 Steel Tubing

MACHINE TIME — 21 seconds (two places); gross production 340 places or base.

NO. OF OPERATIONS—12; 6 on each



4-inch, 8-Spindle **ACME-GRIDLEY Bar Automatic**

4 % -inch, Single Spindle ACME-GRIDLEY Bar Type Fully Automatic Turret Lathe



3 13/16

FINGER HOLDER SPOOL

MATERIAL-4620 Steel Tubing

MACHINE TIME—3 minutes; gross production, 20 places per hour

NO. OF OPERATIONS-15, Including angular turning attachment. Carbide tooling

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THREAD ROLLING

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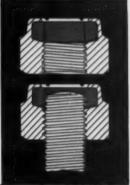
this STOP NUT?

Several things make this nut unusual. For instance, you can "stop" it at any position on the threaded length of the bolt . . . or wrench it tight against the work where it protects bolt threads against corrosion and prevents liquid leakage. No matter where you leave it on the bolt, it will remain tight in that exact position, even though you subject it to heavy vibration and shock loads. But use a wrench on it and it comes off as easily as it went on. The red locking collar is nondestructive—does not gall bolt threads or remove plating. You can remove it and re-use it again and again.



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- 2 The bolt impresses a mating thread into the collar and the resulting compressive forces exert a constant friction grip on the bolt....



- 3 and exert a downward thrust bringing the lower flanks of the bolt thread into firm metal to metal contact with the matching nut threads, eliminating normal axial play.
- 4 Nut is removable and reusable . . . the Red Elastic Collar retains its grip after repeated usage.

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What about sizes and materials?

Elastic Stop nuts are available from a watchmaker's 0-80 all the way to 4"—in materials that include stainless steel, brass, aluminum and other alloys. Protect your product with "fastener insurance." Try Elastic Stop nuts on trouble spots, whether to protect expensive heavy equipment from costly downtime or to guarantee the accuracy of delicate electrical equipment by maintaining precision adjustments. We'll supply free test samples,





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Please send the following free fastening information:

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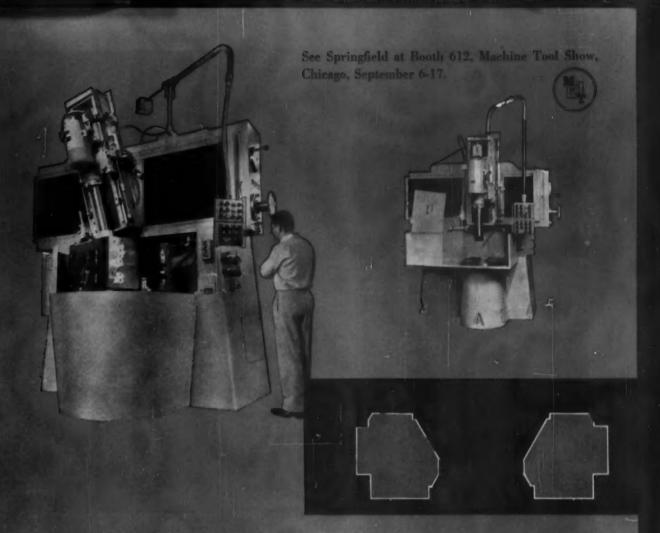
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one setup: nine jobs

As flexible, as responsive as a dentist's drill, a Springfield Vertical Universal Grinder can reach around and into a workpiece to do nine different jobs on one chucking.

If you make a pipeline valve, a mold, a bearing race—requiring micro-inch finish on any or all the faces shown in the diagram—at whatever angle—look into Springfield. These grinders cut down the number of set-ups, frequently eliminate hand-lapping, operate with fewer work-holding devices. And, as a bonus, on jobs calling for extreme concentricity, one angle setting of the Springfield head grinds both faces of mating parts.

All three models readily adaptable to special problems.

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CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

7 WAYS to SAVE MONEY with TOCCO* Induction Hardening



Cost was reduced 94% when heat-treatment of this cornharvester part was changed from carburizing to TOCCO-hardening, 9½c saved on every piece — \$4750 on each 50,000 piece batch, plus an hourly production increase from 120 to 300 pieces per hour.



Leading automotive companies need and use TOCCO hardened axle shafts to handle higher horsepower. Better, yet cheaper—savings of \$375.00 per day. Less machining costs, lower priced material, increased production, and a plus in quality—200% greater torsional life.



Kearney & Trecker Corp. reduced the cost of hardening this milling machine part from \$1.57 to 10c apiece. In addition TOCCO made possible a switch from alloy to S.A.E. 1045 steel—saving another 11c per piece in material cost. Kearney & Trecker hardens 140 different parts on one TOCCO unit.



Thompson Products Ltd. boosted production of these automotive wrist pins from 500 to 1200 per hour when they switched to TOCCO-hardening. Costs fell from \$5.45 to \$3.25 per hundred parts—a savings of 2c per pin, \$26.40 per production hour.



Mechanics Universal Joint Division of Borg-Warner reports a 69% savings in the hardening of stub ends for propeller shafts. TOCCO also upped production from 35 to 112 parts per hour—over three times as fast as conventional heating methods.

Lima-Hamilton Corporation adopted TOCCO for hardening this shifting lever. Results: a savings of 4c per piece—\$25 per production hour. TOCCO costs only 17% of former heating method. This is only 1 of 139 parts TOCCO-hardened by Lima-Hamilton Corp. All show savings over usual heating methods.





Number 7—the lucky number—is up to you. Why not add your name to the list of companies who use TOCCO Induction Heating to increase production, improve products and lower costs. TOCCO engineers are ready to survey your plant for similar cost-saving results—without obligation, of course.

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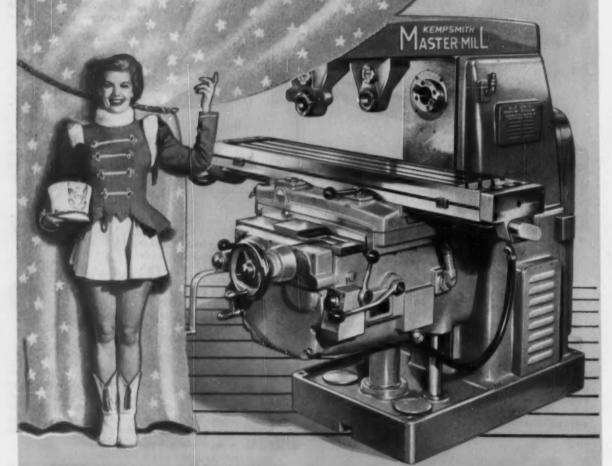
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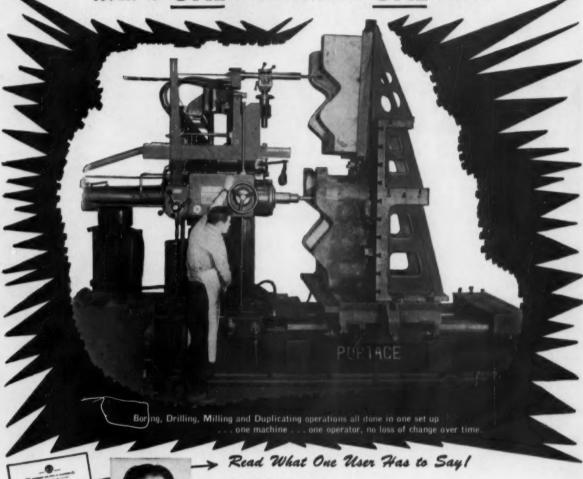
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P. J. Holstein, President The Superior Die, Tool & Machine Co. Columbus 7. Obio

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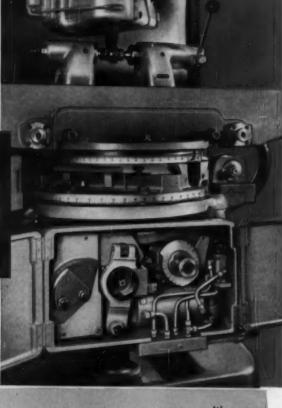
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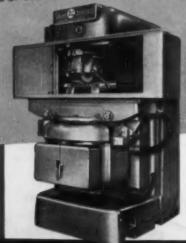
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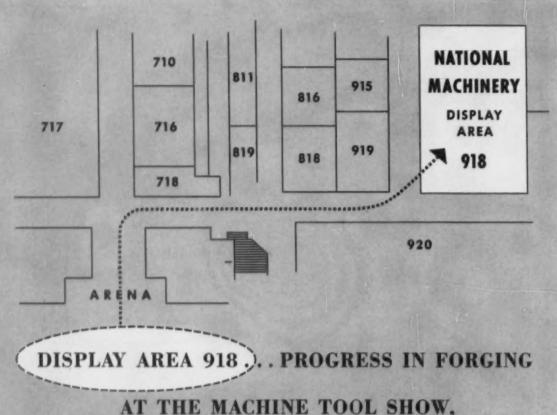
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DESIGNING WITH ALUMINUM

This is one of a series of information sheets which discuss the properties of aluminum and its alloys with relation to design. Extra or missing copies of the series will be supplied on request. Address: Advertising Department, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California.

ALUMINUM VS. STEEL STRUCTURALS

THE light weight, strength and corrosion resistance of aluminum alloys are causing them to be increasingly considered for applications where structural steel has been the traditional material of construction.

Aluminum weighs about 0.10 lb. per cubic inch, structural steel about 0.28, or nearly three times more. Aluminum structures weigh from 35% to 70% of their steel counterparts, which suggests a number of economic advantages to be gained through the use of aluminum:

- 1. Ease of handling light sections in the fabricating shop.
- Reduced shipping and erection weight - hence, the possibility for greater off-site fabrication.
- 3. Reduced erection time with attendant reduction of construction costs and earlier placement of the structure in service.

It also points up applications wherein the fullest advantage of weight reduction is to be gained:

- 1. Long-span structures in which the greatest load is the weight of the structure itself.
- 2. Structures whose component parts must be shipped long distances and erected in difficult-to-reach
- 3. Structures which are difficult to erect or which must be erected without the aid of heavy lifting equipment.
- 4. Structures in which demountability or portability is a requirement.
- 5. Mobile structures which impose a dynamic load on their supports and may have power requirements.
- 6. Structures located in areas where

expensive foundations are required.

7. Applications which impose additional loads on existing structure.

Aluminum alloys are highly resistant to atmospheric corrosion. No surface treatment is required for most of the alloys used in structural applications. This is an obvious advantage over structural steel which must be initially protected by galvanizing or painting, and periodically repainted during the lifetime of the structure.

Corrosion resistance therefore suggests additional economies, beyond those found in weight savings, for aluminum structural applications:

- 1. Exposed structures, particularly those located in industrial atmospheres and areas of high humidity.
- 2. Structures which are expensive to repaint because of location or intricacy of detail.
- 3. Structures which must be taken out of service to allow mainte-
- 4. Structures composed of light members in which arbitrary corrosion allowances determine the minimum thickness of steel members permissible in the design.
- 5. Applications in which an attractive, permanent finish is required.

Well-designed aluminum structures weigh considerably less than similar steel structures. This is due not only to aluminum's low density in relation to steel, but also to the strength and elastic properties of the aluminum alloys. Figure I lists certain of the typical and minimum tensile properties of several of the aluminum alloys commonly used

in structural applications, and those of structural steel.

It will be observed that the tensile yield strength of alloy 6061-T6 compares with the yield of structural steel while the ultimate tensile strength of alloy 2014-T6 is the same as the ultimate of steel. Since permanent deformations in a structure caused by stresses in excess of the yield strength of the material are generally considered undesirable, design working stresses are usually selected by applying a suitable factor of safety to yield strength. On the basis of yield strength, then, a 6061-T6 ten-



All aluminum TV antenna at Long Beach, California.
Prefabricated in approximately 20-foot sections.

sion member would carry the same load as an identical structural steel member and weigh less than 1/3 the steel member.

Some designers apply a somewhat greater factor of safety to the tensile yield strength of the aluminum alloys than to that of steel because of the difference in spread between yield and ultimate. It is important to note that even if the same safety factor were applied to the minimum ultimate tensile strength of 6061-T6 and structural steel, the 6061-T6 member would weigh less than half that of a steel member carrying an equivalent tensile load. In addition, the aluminum member would provide a greater margin of safety against permanent deformation.

FIGURE 1 **Typical Tensile Properties Minimum Tensile Properties** Elonga-tion % in 2" Yield Yield Matol Strengti P5I rength PSI 2014-T6° 65,000 71,000 55,000 60,000 Al. 5083-O† 22,000 44,000 18,000 40,000 Al. 5083-H1125 24,000 40,000 12 Al. 5083-H113† 33,000 46,000 31,000 44,000 12 Al. 5086-Of 17,000 38,000 22 14,000 35,000 18 AL. 5086-H112† 19,000 39,000 14 18,000 36,000 38,000 AL. 6061-T6 40,000 45,000 17 35,000 10 22,000 16,000 AL. 6063-75 25,000 30,000 12 32,000 6063-76 25,000 AL. 30,000 35,000 12 60,000 24 33,000 ASTM-A7 38,000 60-72,000 Steel

*Fusion welding of 2014 not recommended.

§As extruded. Typical mechanical properties vary according to size and shape of structural sections.

DESIGNING WITH ALUMINUM No. 15 Continued

In many cases, the stiffness of a structural member is the governing factor in design and stiffness is a function of the modulus of elasticity of the material of construction. The modulus of elasticity of the aluminum alloys is about 10.300.-000 PSI while that of structural steel is 29,000,000 PSI. Hence, it will be seen that an aluminum beam will deflect the same amount under its own weight as an identical steel beam, since the aluminum beam will weigh but 1/2 the steel beam. Under the same applied load, the aluminum beam will deflect up to almost three times that of the identical steel beam depending upon the relation of dead load to total load.

If, under the same conditions of loading, stiffness equal to steel is required of an aluminum beam, it can be less than half that of a simply supported beam if unsupported length, loading and beam section properties are equal.

The elastic modulus also affects the stability of compression elements. For example, the load to cause elastic instability of an axially loaded slender column is directly proportional to the modulus of elasticity of the metal used. Hence, an aluminum column will carry but 1/2 the load of an identical steel column, but will weigh only 1/3 as much as the steel column. By selecting a somewhat heavier aluminum section, it is possible to support a load equal to that of the steel column with substantial weight reduction. For example, an 8" x 8" wide flange aluminum column will support about one-half again as great an axial load as an 8" x 5" wide flange

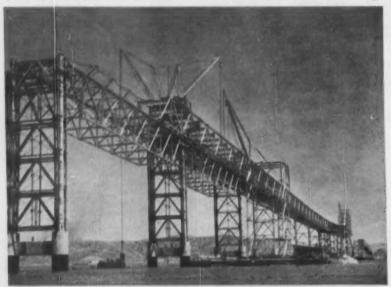
pact loads and reducing stresses caused by inexact fit-up of members in a structure. Because of the lower modulus, stresses induced by temperature changes in restrained members are less for aluminum than for steel. This is in spite of the fact that the coefficient of thermal expansion of aluminum is about 0.000012 in/in/°F, or almost twice that of steel.

Procedures involved in the fabrication of aluminum and steel structures are comparable. As with steel, joining can be accomplished by riveting and bolting. Aluminum rivets and bolts are usually used in aluminum structures for maximum corrosion resistance. Either hot or cold driven aluminum rivets can be used. Holes for aluminum rivets and bolts in primary structural members are drilled or subpunched and reamed and aluminum members are sawed, sheared or cut with a router rather than fiame cut.

Aluminum members can also be joined by welding. Allowable stresses across welds are reduced to offset a certain reduction in strength in the heat affected zone. Two new alloys, 5083 and 5086, recently developed by Kaiser Aluminum, show great promise for welded aluminum structural work. Inert-gas arc welds of these alloys in plate and sheet exhibit joint efficiencies varying from 80% to 100%, depending on the original temper of the base plate.

Hence, the use of standard aluminum structural shapes offers exciting possibilities to the designer in the development of efficient structural solutions. In addition, the extrusion process makes possible the economical production of special aluminum sections for unique design situations. Kaiser Aluminum engineers, experienced in the design of aluminum structures, will welcome the opportunity to assist you in designing with aluminum.

Contact the Kaiser Aluminum sales office listed in your telephone directory or one of our many distributors. Kaiser Aluminum & Chemical Sales, Inc., General Sales Office: Palmolive Building, 919 North Michigan Ave., Chicago 11, Illinois; Executive Office: 6875 Kaiser Building, Oakland 12, California.



285' riveted aluminum falsework truss. Preassembled on shore and floated to jobsite. Readily lowered and moved between towers in its use as erection platform for construction of San Rafael-Richmond, California bridge. Weight 110 tons. Estimated weight in steel approximately 300 tons.

achieved—with substantial savings in weight—by selecting an aluminum beam having increased section properties. For example, a 7" aluminum I-beam weighing 5.42 lbs. per foot has three times the moment of inertia of a 5" steel I-beam weighing 10.0 lbs. per foot, nearly twice as much. Thus, equal stiffness is provided and stresses due to bending in the aluminum beam will be less than half those in the steel member.

To take full advantage of the high strength of the aluminum alloys, deflection criteria should be closely examined to make certain that the design is not needlessly penalized by arbitrary and unnecessarily severe deflection limitations. Reducing deflection through the use of rigid framing and continuity should not be overlooked. The maximum deflection of a uniformly loaded, continuous beam of two equal spans is

steel column of the same length before becoming elastically unstable. Yet, the aluminum member weighs 11 lbs. per L.F., the smaller steel section 20 lbs. per L.F.—nearly twice as much.

Aluminum's lower elastic modulus has a beneficial effect in absorbing im-

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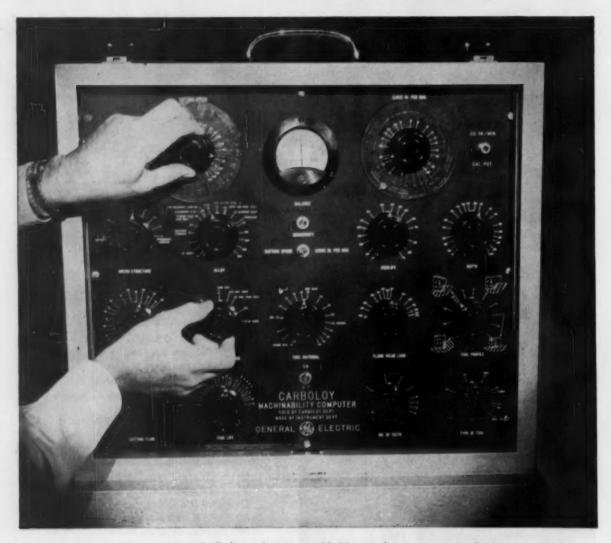
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Cutting Tool:

Tool material
Tool life
Flank wear land
Tool profile
Type of tool
Number of teeth

Cutting Conditions:

Cutting fluids Feed Depth of cut Cutting speed Motor horsepower Cubic inches per minute Unit horsepower Work diameter R.P.M.

See the Computer in action at the Chicago Shows-September 6-17

COMPUTER

- New engineering tool solves complex machine setup problems in seconds, instead of hours
- Shows how to vary cutting conditions to increase machine, cutting tool, and operator efficiency

In seconds, the low-cost Carboloy® Machinability Computer calculates the effect of 19 basic machine performance, tool life, and output.

In seconds, it shows optimum operating conditions for any metal-cutting job, eliminating wasteful experimental runs.

In seconds, it shows how to improve existing setups by the right variation of operating conditions

Easy to use

The Carboloy Machinability Computer is easy to operate. Anyone with machining experience can use it after a short familiarization period.

Results are numerical—requiring no further interpretation from the direct-reading dials. Accuracy is assured—based on more than a year's testing on in-plant applications at key General Electric plants.

Handles many jobs

The Carboloy Machinability Computer handles basic information on operating conditions, type and condition of work material, style and material of tools. The computer accurately predicts cubic inches per minute removed, tool life, and required machine horsepower. It shows how changing speed, feed, depth of cut, or tool material will affect these and other variables.

The Computer solves—in seconds—problems that would be otherwise impractical because of the large number of machining variables involved.

The Carboloy Machinability Computer was developed and proved in the field by a team of Carboloy and General Electric engineers, under the direction of Dr. W. W. Gilbert, of G.E.'s Manufacturing Services Division.

The Computer is portable (weighs only 32 lbs.), battery-operated, and measures 21" x 7" x 20".

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TYPICAL IN-PLANT COMPUTER APPLICATION

PROBLEM: Setting up 16", 10-HP lathe to turn hot-rolled 1020 steel bar with 10" diameter, to get tool life of 1 hour.

SOLUTION: Starting from scratch on a new setup, days could be used by experienced tool men to find a satisfactory set of operating conditions . . . with no assurance that the result would be the best possible. With the computer, the optimum setup was established, and the effect of changing key variables compared, in less than $15\ minutes$.

SENEFITS: Computer turned lengthy setup time into valuable production time. On this job alone, the savings gained through days of extra production, plus savings in manpower costs, would more than equal the cost of the computer.

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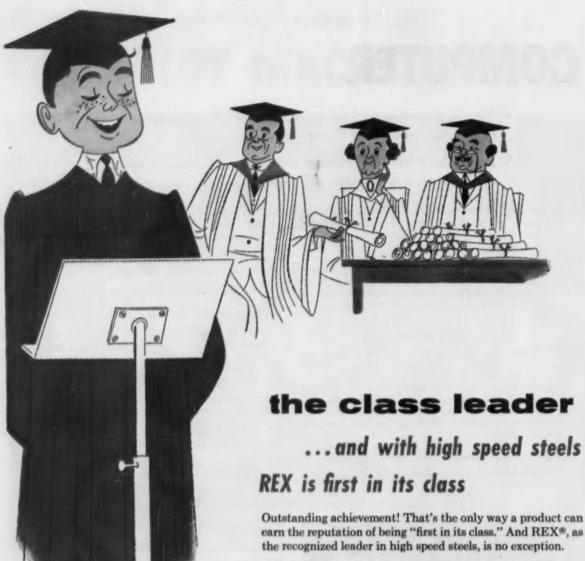
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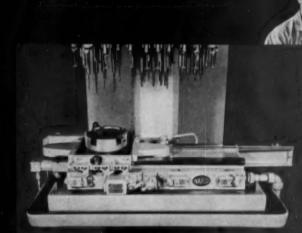
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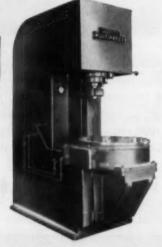


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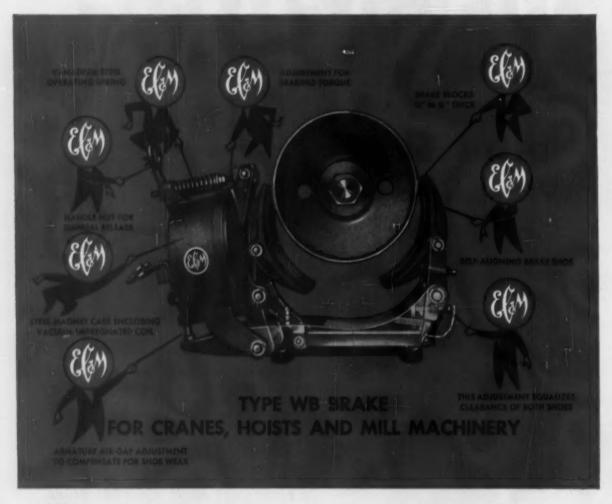
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Mattison Combination Way and Surface Grinder

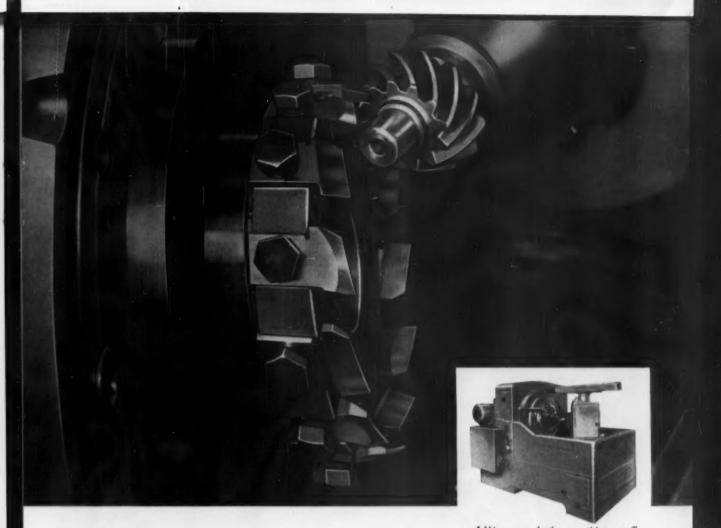
with independent vertical and horizontal spindles It's a machine tool builder's machine, for grinding large bed castings, columns, tables, slides, saddles, and heads faster, to precision tolerances, without costly rehandling. You can grind "V" and flat ways, dovetails, shoulders, edges, radii, and contours . . . all in a single setup. Independent vertical and horizon-

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HIGH-POWERED PRECISION SURFACE GRINDERS



This new generator Cuts medium-size bevel gears faster than ever!

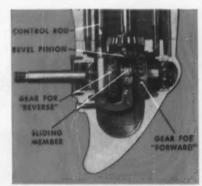
Several things have been done to make this new Gleason No. 106 Hypoid Generator the fastest machine for producing medium-size bevel gears.

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Few adjustments required Since fewer adjustments are necessary, faster setup and change-over are attained.

Extreme operating flexibility is one of the outstanding features of the 106. This permits its use for jobbing, production and completing. When it is arranged for completing, gears are finished directly from the solid blank.

This machine handles gears from 2'' to $8\frac{1}{2}''$ diameter, 4DP and finer, with ratios up to 10/1, cone distances up to $5\frac{1}{4}''$. We will gladly send you more details on request,



Spiral bevel gears similar to those in this outboard motor drive are cut accurately and quickly on this Gleason machine.



EASON WORKS

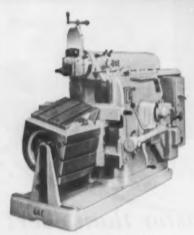
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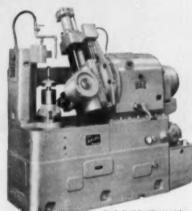
G & E 24" Industrial Universal Shaper



BOOTH 1424

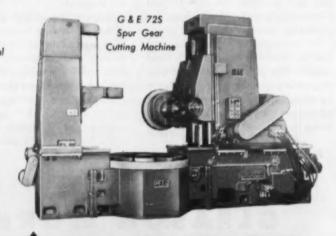
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G & E 10HQ HoBlique Helical Gear Hobbing Machine





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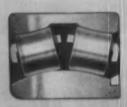
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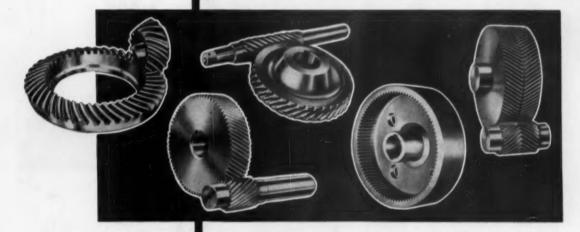
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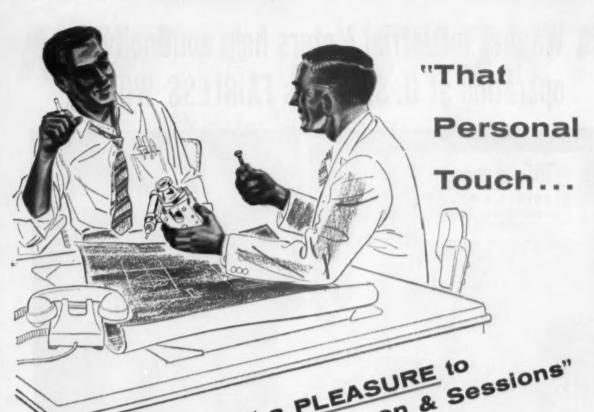
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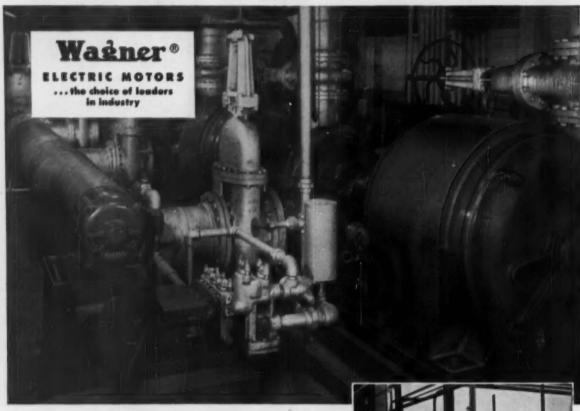
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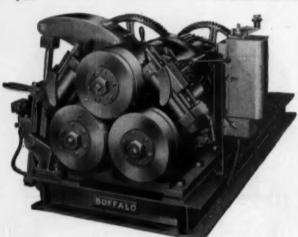
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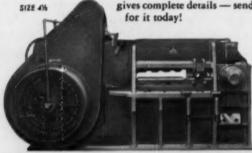


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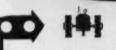
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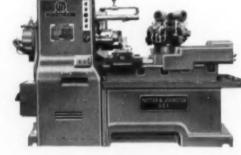
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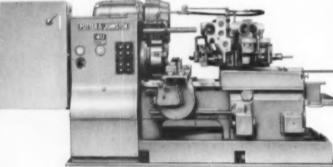
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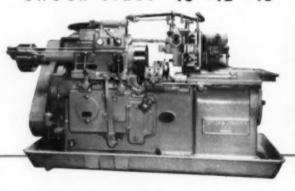
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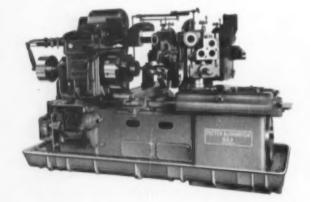
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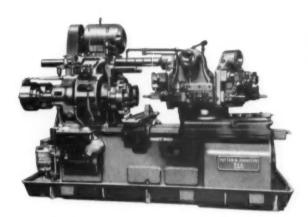
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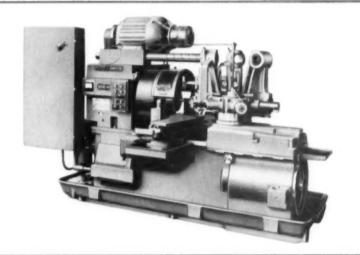
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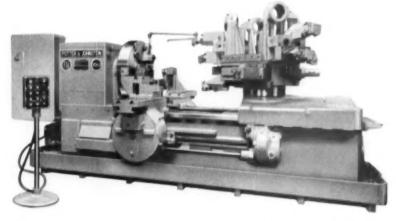


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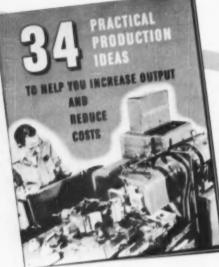
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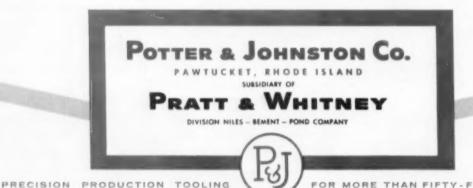


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"Saves inspection time" reports Rockford Acromatic Products Company. Surfindicator is used to check finish of automotive, farm implement and appliance screw machine parts.



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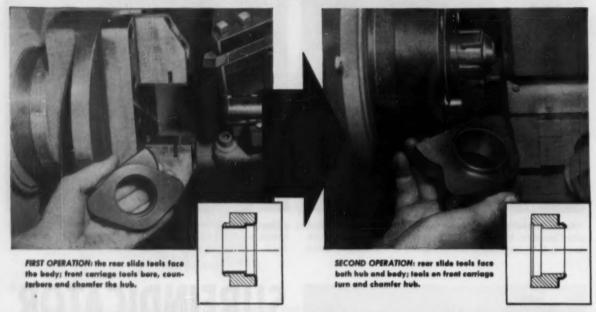
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12" Automatic Lathe which combines speed and accuracy with easy setup, Ideal for both chucking and between-centers werk.



One operator with two standard machines now handles these cast iron manifold bodies in rapid succession—at a pace of 80-perhour, at 80% efficiency.

This two-machine team pays off many ways: The operator loads and unloads one machine while the other is working—automatically. Investment is at a minimum because both machines and tooling are standard. Tool setups and replacements are simple.

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The U.S. Vertical Milling Machine is designed to speed work, assure precision milling. Its heavier knee and table, wider saddle and increased bearing surfaces provide the rigidity absolutely necessary for close work. Its accuracy is certified.*

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*Certified Accuracy-Check list showing results of actual tests accompanies each machine.



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- New giant-size Dials
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POWER HEAD

- Feed infinitely variable from .002" to .008" per revolution.
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SPECIFICATIONS:

10" x 36" or 10" x 42" 24" or 30" Table size Longitudinal Feed Cross Feed

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approx. 1 ton "-12" per min. Table Power Feed 0' (infinitely variable) SEE THE QUARTET at the Coliseum Show, Booth 616.

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FLOOR SCRUBBING MACHINE parts are cleaned thoroughly in 5 minutes in a Wheelabrator — eliminating hours of wire brushing.



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GAS AND WATER METERS are rebuilt at 1/5 the cost of new ones. Wheelabrator cleaning removes all rust and surface corrosion in minutes.



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WHEELABRATOR TUMBLAST



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WHEELABRATOR SPECIAL CARINETS

Reconditioning of metal parts is a profitable operation with Wheelabrator Airless Abrasive Blast Cleaning. In minutes, Wheelabrating restores parts to original surface cleanliness by uniformly removing all rust, dirt, scale, paint, etc. No other method provides the surface required, at production speeds, for protective coatings. Write for details for your reconditioning problem.

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at American Shipbuilding Co., Lorain, Ohio

"Even before we moved a bit of material, our Plymouth Model MDT Diesel showed us how to save," says Mr. Gordon Stafford, Manager of the Lorain yards. "We made considerable savings just by cutting out the time we formerly needed to stoke up our steam locomotive and build up sufficient steam pressure.

"Right down the line, Plymouth pays its way in savings and better performance. Big things like better fuel efficiency, less down-time and maintenance costs and those little extras like eliminating the smoke nuisance in our neighborhood are just part of the story. Plymouth's dependability for day-after-day performance has helped us meet tight production schedules familiar to every shipbuilder."

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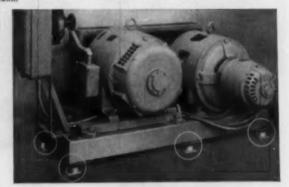
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NO RUBBER - Deterioration eliminated

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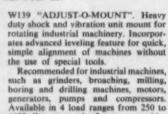
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LESS MAINTENANCE - Machines stay aligned

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will not wear out



4000 lbs. per unit. Larger capacities available, Natural frequency: 12-18 c.p.s.

MORE STABILITY - Machines will not walk **REDUCED NOISE** — Structure-borne rumble eliminated

CLOSER TOLERANCES — Product quality improved

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INCREASED PROFITS - Fewer rejects

IMMEDIATE SERVICE - Less down time for installation

SERIES W300. Heavy duty shock and vibration mount recommended for rotating machinery, presses, generators, pumps, compressors, milling machines and other heavy industrial machinery. Available in 3 load ranges from 100 to 1500 lbs. per unit.

Natural frequency: 12-16 c.p.s.



Send for Bulletin No. 850, "Robinson Vibration and Shock Mounts for Industry", "Trends" sheets Nos. W100 and W101 give engineering information on the 2 mounts illustrated.

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One of the key factors in American Zinc's widespread mining and milling operations. In Tennessee, American Zinc also owns and operates mines in Jefferson County. It is here that one of the largest known reserves of zinc in the United States is found (in excess of 1,250,000 tons of recoverable zinc, proven, with additional large reserves indicated). Other company-owned and operated mining properties are located at Platteville District, Southern Wisconsin; Metaline Falls District, Eastern Washington; and Picher field of the Tri-State Area (Missouri-Kansas-Oklahoma). For the complete picture, see map above.



AMERICAN ZINC, LEAD & SMELTING COMPANY

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The Iron Age Newsfront

New Chromium Plating Process

Titanium, aluminum and steel parts chromium plated by a new process have shown exceptional resistance to chipping and peeling under severe test conditions. On a small aluminum business-machine part, the coating has lasted through more than 18 million impressions without sign of failure.

Chips: Chain Drags Them Out

Disposal of cast iron chips from machining operations at one new plant has been expedited by allowing them to drop through hollow machine tool bases into a concrete-lined trench. A drag chain moves them along. As a refinement, a strong down draft every 80 ft along the machining line forces dust particles into the trench.

Inland Waterway Traffic Swells

River and canal traffic has increased sharply over the past year and the trend is still continuing. The trend is attributed to the hundreds of new fabricating plants, power plants, warehouses and elevators which have sprung up along waterfront sites—with more to come. Coal and petroleum traffic is very heavy.

Late Auto Changes Rush Die Shops

Changes in 1956 cars to be introduced soon will generally be more extensive than originally planned. Many last minute changes are being rushed through the die shops to beat the deadline. However, only two models will have major body changes.

Largest Aluminum Crane To Make Debut

The largest aluminum crane and the first of allwelded construction is now being built for one of the large aluminum producers. It'll have a 100-ton capacity and will be one of seven ranging down to 10 tons. Earlier attempts at aluminum cranes were plagued by electrolytic corrosion around steel rivets.

Container Makers Face Cutback

Producers of steel shipping containers, who showed an 8.8 pct rise in first half output over a year ago, face expected cutbacks in hot and cold-rolled sheet allocations. Feeling is, however, that they'll be no worse off than other major sheet consumers. Largely responsible is the heavy uninterrupted demand from the auto industry.

U. S. Catching Up On Own Invention

A real switch on American ingenuity perfecting European ideas is beginning to right itself. In 1841, James Rand, an American, devised the first collapsible tube. The continent has promoted the idea to the extent that 90 pct of all mustard sold in Switzerland is packaged this way. American producers are now planning to merchandise, in addition to toothpaste, jelly, paint, putty, meat spreads, condensed milk and other food items in tubes.

Steelmakers Look Ahead

New interest in steelmaking is tied in with the all-basic openhearth furnace. The 20-pct gain in capacity over the conventional silica brick openhearth has prompted two steel producers to schedule work on all-basic furnaces for next year.

Continuous Cast Aluminum: Potential Good

Continuous cast aluminum rounds, squares and hexagonal shapes are now in pilot production in the midwest with output reported well over previous batch processing. Diameters range from one to five inches with major limitations being on types of cross-sections. The market appears sizeable, including replacement of some wrought forms—some new applications.

Z



IN-LINE CONTINUOUS HEAT PROCESSING STEPS UP COLD EXTRUSION OPERATIONS

Intermediate annealing of ordnance items between cold extrusion—cold forming press operations at Heintz Manufacturing Company, Philadelphia, has been reduced from 2 hours to 7 minutes per cycle, with Selas Thermo-Automation.

Selas Gradiation furnaces at Heintz Manufacturing Company's new cold extrusion plant.



Selas automatic, precision-controlled heat assures metallurgical uniformity within each workpiece . . . in spite of varying cross-section . . . and reproducible uniformity from piece to piece . . . to meet rigid metal-flow requirements of cold extrusion methods. Gradiation high-thermal-head furnaces occupy less floor space, and reduce inventory of work in process. Scale is virtually eliminated.

This is another example of Selas Thermo-Automation at work. This advancement in heat processing offers tremendous possibilities for savings in time, labor and money . . . and the improvement of quality in heat treating, brazing, strip annealing and other continuous operations. Write for folder entitled, "Short Cycle Annealing for Cold Extrusion of Steel".







CORPORATION OF AMERICA . PHILADELPHIA 34, PA.

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MACHINE TOOLS: The Show Goes On

Eleven-day show involves millions in machine tools . . . Work started months ago moving into Chicago's International Ampitheatre . . . more than 125,000 will attend giant exposition—By G. J. McManus.

 MACHINE Tool Show planners faced this problem: How to set up a heavy industrial plant that will run full tilt eleven days and then go out of existence.

In effect that's what the show involves. At 10:00 a.m., Sept. 6, builders begin operating their star models in a 20 million dollar tool display. Cylinders will be bored; shafts will be ground. Finished screws and gears will be shipped to users.

An authentic machine shop display will be staged in front of more visitors than any shop ever saw. Over 100,000 purchasing agents, engineers and production men will view operations with expert eyes. This shop will have no shake-down period and slips will show.

In addition, visitors must have an occasional bite of food and a place to pack their toothbrushes. Transportation, information, communications must be provided on a massive scale.

Long Planning

For eleven days, the show will function as a busy, hospitable shop. The theme of "saving through mechanization" will be drilled, ground, and pounded home. Then at 5:30 p.m., Sept. 17, operations will cease. The shop will go out of business.

All of this suggests that the 1955 show called for a lot of thought and work. It did. National Machine Tool Builders Assn. and show manager Clapp & Poliak, Inc., of New York have been preparing for the current exhibit practically since the close of the 1947 affair.

In addition, Clapp and Poliak is producing and managing the

Production Engineering Show for controls, attachments, cutting tools metalworking accessories, etc. This will be at the Navy Pier in Chicago, running the same days as the Machine Tool Show but with dovetailed hours.

First big problem for show planners was finding a site. The town had to have hotel facilities for a record gathering. It had to provide a hall big and strong enough for a heavy industrial outlay.

Space Needed

Chicago's International Amphitheatre was the logical choice. It had a large ground floor of almost unlimited load capacity; an upper deck rated at 200 lb per square foot. It was located in the convention headquarters of the world, well equipped to handle crowds.

The Amphitheatre was fine. All that was needed was more of the same. More space; more facilities. The show people went into a huddle with the Amphitheatre owners and came out with an agreement that saw the new Exposition Hall planned and NMTBA signed up for three future shows in Chicago.

The new hall adds 188,000 sq ft to the Amphitheatre's original 240,000 sq ft of floor space. Completed last fall, the addition cost about \$1 million, makes the Amphitheatre the country's largest arena suitable for machine tool display.

Exhibitors Eager

With location set, show preparations began in earnest. It's been a steady flood of details with no beginning or end to different stages. Fifteen thousand hotel rooms were earmarked early in the game. By November of last year 10,000 of these had gone. By the time it's all over, the show figures to produce the largest hotel booking in history.

Machine Tool Show Attendance



SPECIAL REPORT

Filling the hall with exhibitors was mainly a question of sending out application forms and then trying to figure out how to squeeze all the companies in. Most exhibitors started to pay for their space on a regular basis last December, had to make firm commitments several months before that. Builders were asked to keep their space requests to an absolute minimum but when all returns were in, it was necessary to cut everyone 18 pct.

Working out the display floor plan was largely a jigsaw operation with Chicago's fire department setting the boundaries, exhibit size and weight determining placement. Machines were where they would fit; there was no question of drawing straws for choice positions.

Hundreds of Machines

Next problem was to get equipment installed. This was a big one. Industrial shows normally figure 2 weeks set-up time. The Machine Tool Show worked on a 14 week installation schedule with all arrivals strictly timed according to floor location. Idea was to work from the wall out and avoid blocking a corner exhibit with an early arrival.

In early June, the first machines began arriving at the Amphitheatre. The first of 175 carloads



TRUCK CRANES shift and position display machinery in the arena area of Chicago's International Amphitheatre for the Machine Tool Exhibition.

rolled into the new hall, where a sunken track accomodated 10 cars at a time. A stream of 1200 road trucks began backing up to Amphitheatre docks, enlarged to take 15 trailers at a time.

In all, 500 machines having a total weight of more than 4600 tons arrived at the show. These ranged from deak to two-story size: from a few hundred pounds to over 100 tons. Largest was a 108 ton mechanical press. More than 523 items required special skilled han-

Crews of trained riggers, numbering over 150 at the late-August peak, worked machines from carrier to floor. Big locomotive cranes handled machines in the center of the arena, where the ceiling goes up 73 ft. In low ceiling areas, Aframes took over the handling job.

To get one crane into the hall, a row of seats and an 18 ft cross girder had to be ripped out. Other alterations included the enlarging of an elevator entrance by 5 ft and the boosting of elevator load ca-

Equipment installation involved more than just setting units in place. Big broaching machines, shears and brake presses would have towered over viewers if their bases were flush with the floor.

Acres for Crates

To bring working areas near eye level, pits were sunk in the floor. Big machines were lowered into holes as deep as 8 ft, as broad as 15 ft. In other cases, platforms were erected to give showgoers a close-up view of vital areas.

An incidental matter that had

Three Shows in Chicago, Sept. 6-17

MACHINE TOOL SHOW

International Ampitheatre

Metal cutting, grinding and forming equipment will exhibit the latest automation techniques for quality mass production. General purpose metalworking machines will show new highs in power and flexibility.

PRODUCTION ENGINEERING SHOW

Navy Pier

A practical guide to automation. Exhibits and technical advice on monitoring, handling, governing, special production, equipment controls, communications, inspection and gaging, and machine tool accessories.

COLISEUM MACHINERY SHOW Chicago Coliseum

More than 100 nationally known producers of general purpose machinery, specialty equipment, heat treating, cleaning and finishing, welding and processing machines will feature new units and improved products.

TRANSPORTATION

to be considered in the show set-up was what to do with shipping crates. At the Machine Tool Show, everything is king-sized and the crates are no exception. Five acres of storage space had to be staked out for them.

Preceding and accompanying equipment installation was the job of getting the show in operating order. A high tension line was run from the Central Manufacturing District power plant to provide the Amphitheatre with 60,000 kwa—largest load of any building in the world. Seven big transformers were installed. Bus ducts carry high voltage directly to exhibit areas.

All told, something like 225 electricians worked on the display. Water for machines and men was another vital necessity. To connect pipe, install coolers and eliminate drips, 75 plumbers have been employed at the show.

Tons of Scrap

Finally there was the job of prettying the place up. Machine tool men play it straight, avoiding theatrics and ornate displays. Still, 200 carpenters, 300 laborers and over 175 decorators worked at the show. Twelve miles of chrome chain were strung across exhibits. Furniture was installed. The shop theme will be maintained but it will be very bright.

As a visitor watches different machine tools in action, it may occur to him that quite a bit of metal is being chewed up. The show machines will generate 50,000 lb of scrap. Arrangements had to be made for collecting and classifying this.

A sharpeyed visitor will probably notice that when little problems arise in the hall, someone in authority will quickly appear. This again is no accident. Each of the floor managers at the show will carry a Dick Tracy radio. These pocket units will receive voice transmission, giving floor men directions or calling them to phones.

Buses will carry visitors from the Machine Tool Show to the Production Engineering Show or to the hotels. Within the Machine Tool Show, four electric buggies will whisk key men about. Helicopter service will operate between the Stockyards and the Navy Pier.

STAINLESS: Hits the Road

High strength, low weight give stainless added value in trailer field . . . Noncorrosive properties help extend life of hauling units . . . Avoids annual paint job.

◆ STAINLESS STEEL trailers of a new type construction are finding a strong initial demand in the trucking industry.

Fruehauf Trailer Co. which recently introduced the "Volume Van," reports the stainless unit's light weight and high strength find a ready-made market for hauling jobs that cannot be done with conventional aluminum trailers.

Biggest advantage of stainless steel over aluminum is strength. Because stainless is $2\frac{1}{2}$ times stronger than ordinary steel or aluminum, parts can be made of lighter construction and still retain comparable strength.

More Capacity

This gives the stainless trailer an initial size advantage. A new stainless trailer's light construction gives it an inside width of 94 in. of an outside width of 96 in. Length is only $4\frac{1}{2}$ in. less than overall length of a trailer.

Stainless's other properties give it additional advantages for trailer

construction. Although initial price of the trailer is higher than an aluminum unit, longer wear can make a unit less expensive to operate.

The units never need painting because stainless is noncorrosive. Even if the surface is scratched or broken, it will not provide a niche for costly corrosion to get a foothold.

New Design

Life expectancy of a stainless steel trailer can be at least three times as great as other trailers under hauling conditions involving corrosive trailer loads.

Fruehauf has been producing stainless trailers since the early 40's. Older models were oval shaped, permitting less payload than the new box-type van.

Sides, roof and doors for the new trailers are being fabricated by the Budd Co. plant in Philadelphia for assembly at Fruehauf's Ft. Wayne, Ind., plant.

Machinery:

\$90 billion spent since V-J Day on plant machinery.

Some \$90 billion worth of industrial machinery has been bought by private industry since V-J Day, according to a special study made by C.I.T. Corporation, industrial financing firm.

By the yardstick of machinery purchases, industrial growth in the decade since Japan's surrender was four and a half times as great as in the 12-year period from 1929 to 1941. In that period, machinery purchases amounted to only \$19.6 billion, C.I.T. reports. The firm points out that under its Pay-As-You-Depreciate financial plan, machinery can be paid for at about the same rate it can be depreciated under the new tax laws.

Metalworking

The corporation's study also showed that metalworking machinery accounted for \$8.7 billion in private industry purchases in the 10 years since V-J Day. This is reportedly over three times the dollar volume of purchases from 1929 through 1941, and about 1½ times the physical quantity.

The study was based on official government statistics.

Junilys: INTERVIEWS:

The Iron Age Interviews:

Thomas P. Pike

Analyzes Machine Tool Reserve

Program geared to meeting all out emergency needs . . .
Nearly \$3 billion in Govt. tool holdings already listed . . .
About 55 pct of reserve tools in use on defense contracts.

Q. What steps is the Defense Department taking to ward off a critical shortage of machine tools in the event of an all-out emergency?

A. The Department of Defense works closely with the Office of Defense Mobilization and the Business and Defense Services Administration, Department of Commerce, in proposing national policy and assisting in formulating policies that would help the machine tool industry to build up its capacity in the event of all out mobilization. These policies would include but not be limited to such things as pool order contracts, pool orders, and industry priorities for manpower, and materials.

We are also supplying to ODM and BDSA our estimated machine tool requirements so that they may survey the industry to ascertain availability of capacity, and initiate actions required to expand segments of the industry in which shortages potentially exist.

We are also actively engaged in a reserve tool and facilities program. This includes the procurement of tools for mobilization use and at the same time assists the industry to remain in a healthy operating condition.

Q. What is the status of the Defense Department's machine tool reserve in terms of units and total dollar value?

A. We consider that every machine tool owned by the military departments constitutes our machine tool reserve and would be used to cut chips or otherwise fabricate some military item in time of national emergency. We are now obtaining a complete inventory of our machine tool holdings. This inventory is about 65 pct complete and the latest status report lists close to 300,000 items at a reported dollar acquisition cost of almost \$3 billion. Each of the military departments also retains a portion of their total holdings in the Department Industrial Equipment Reserve. These are idle tools that have been placed in storage and we now have in this category over 50,000 items with a reported dollar acquisition cost in excess of \$500 million.

Q. Where are these reserve tools stored?

A. The tools are stored in three categories of locations: (1) on site, in plants where this is possible; (2) in specially constructed storage units in close proximity to the plant of intended use; and (3) in central tool storage depots specially designated for the purpose.

Q. How many reserve machine tools have been leased to manufacturers for (a) military production (b) non-military production?

A. (a) About 55 pct of the production equipment owned by the Department of Defense is in use on defense contracts. (b) Less than



HONORABLE Thomas P. Pike, Assistant Secretary of Defense (Supply and Logistics), clarifies machine tool policies.

one-half of one pct has been leased for non-military production.

Q. Is this number likely to increase? Under what conditions will reserve tools be leased to non-military manufacturers?

A. It is anticipated that the overall number of leased tools will probably increase slightly. But it is not expected that there will be any large volume of military owned equipment utilized for non-defense production. All such leases must be approved by the Office of Defense Mobilization in accordance with ODM Order VII-4, and the primary consideration will always be the maintenance of the mobilization base. Another consideration will be the prevention of unfair competitive advantages to the lessor.

Q. What is the Defense Department doing to keep the machine tool reserve from becoming obsolete?

A. Our policy requires that all tools retained for mobilization shall be in operable condition. Also, we require that the operating characteristics be known and that the equipment be reviewed periodically to determine the need for retention. However, we would like to point out that it is not our claim that we can ever hope to retain a complete reserve of modern tools.

We can be sure that the tools we retain are needed and are capable of performing the functions for which they are retained.

The objective of our reserve policy is to have equipment available cut chips at the outset of an emergency and thus bridge the gap until the machine tool industry can supply more modern and efficient equipment. We believe that the replacement of all obsolete tools would be too great a burden on the taxpayer and would provide insufficient insurance because of the unknown date of an emergency.

- Q. What Congressional appropriations have been made for acquisition of new machine tools?
- A. In the fiscal year of 1955, the Congress appropriated \$100 million. In the fiscal year of 1956, we have requested an additional \$100 million. This amount has now been appropriated.
- Q. What is the Defense Department's estimate of the year by year purchases which will be needed to maintain an up-to-date reserve?
- A. We have recently obtained from the three military departments their estimates relative to additional long manufacturing cycle type tools that would be required to complete their mobilization requirements. This information is of a classified nature and therefore cannot be furnished.

- Q. Do reserve buying plans include purchases of foreign machine tools?
- A. Our initial estimates are that less than 3 pct of the total buying program will be placed with foreign sources.
- Q. What plans have been made for efficient distribution and activation of reserve machine tools in a national emergency?

A. The Department of Defense issued an instruction to the military departments which requires that an inventory of all machine tools be provided to OSD. This central inventory will give information about the name and characteristics of the equipment, the year and place of manufacture, its present location and condition. and an indication of its operability. Included in this inventory is a listing of idle machine tools under the custody of each of the military departments. Furthermore, there has been created in my office a Production Equipment Redistribution Group, which has authority to determine the availability and utilization of machine tools. The group redistributing idle military equipment for current production and this operation provides a basis which can be expanded in the event of an emergency.

We have also required the military departments to establish

central locations within each department where all information relative to machine tools is available. This will eliminate the necessity for going to the individual technical services and bureaus for information. There is already established an urgency system for military end items which will provide the guidance for proper distribution of tools in an emergency.

We believe that with experience being gained on a daily basis, maximum efficiency will be assured in the event of a future emergency.

- Q. Is there enough machine tool capacity to meet current Defense Production needs?
- A. Generally speaking, there is sufficient machine tool capacity to meet current military production requirements. I believe you will understand that exceptions to this general statement exist in specific cases such as special or large elephant type tools for which lead time is sometimes longer than we would like. This situation is not necessarily a function of production capacity, but more of engineering limitations and the size and complexity of the product.

In addition to these difficulties with elephant type tools, we occasionally encounter delivery difficulties for other tools due to a concentrated demand over and above maximum capacity. Usually, this is a short-range problem which adjusts itself when demands normalize. A current example of this situation exists in the case of certain milling machines and screw machines. However, our present buying problem is predominantly for mobilization needs rather than present needs.

How's Our Machine Tool Reserve?

Ass't Sec. of Defense Pike Reports:

- There is sufficient machine tool capacity to meet current military production needs.
- Defense Dept. inventory, 65 pct complete, shows close to 300,000 items at acquisition cost of \$3 billion. Individual military department hold 50,000 items at \$500 million cost.
- About 55 pct of production equipment is in use on defense contracts, less than .5 pct for non-military manufacturers.
- All tools retained for mobilization are in operable condition, with operating characteristics known and reviewed periodically.
- Less than 3 pct of total buying program will be placed with foreign sources.

U. S. Bars Strikers

Disloyal persons, or workers who believe in the right to strike against the government, are now barred from holding U. S. jobs.

A new security measure rules out employment of persons advocating or belonging to an organization advocating overthrow of the government; or who participates in a strike, asserts the right to strike, or belong to an organization claiming right to strike against U. S.

ATOMS: Will They Be Tamed Soon?

Geneva talks clear way for rapid nuclear development . . . Prediction of key breakthrough, open exchanges mark sessions . . . Amiable spirit may ease world tension . . . U. S. prestige up—By G. F. Sullivan.

♦ THE GENEVA CONFERENCE of atomic scientists, which last Saturday concluded 2 weeks of frank discussions of much hitherto secret material, was a milestone on the path of human progress.

The International Conference on the Peaceful Uses of Atomic Energy heard a prediction on use of the enormous power of fusion, gave details on construction of breeder reactors, saw intriging industrial power exhibits.

What did it mean to American industry? Clearly, we are on the threshold of an industrial revolution. Not one that will immediately obsolete fossil fuels and equipment but one which will supplement them with new concepts of power.



VAN De GRAAFF Accelerator is one of the most famous "atom smashers" utilizing electricity to speed up atomic particles for bombardment.

Interchange of information at the conference should speed this revolution. The possibilities of some easing of world tensions should not be overlooked by the businessman. The vital role of the United States in world atomic energy development has improved U. S. prestige abroad.

Statement Startles

And an American company, Westinghouse, was the first to sell a commercial power reactor in the international market. Fiat, in coal-short Italy, is the buyer of a relatively small 10,000-kw package plant.

Technically, the most startling news was the statement by conference president Dr. H. J. Bhabha on the possibilities of fusion. Dr. Bhabha, who is head of India's AEC, said: "I venture to predict that a method will be found for liberating fusion energy in a controlled manner within the next 2 decades."

U. S. AEC Chairman L. L. Strauss later said that the U. S. had been working on the problem for some time, had not yet achieved a "breakthrough." The U.S.S.R., Britain and France are also working on controlling the H-bomb reaction.

Current source of controlled atomic energy is fission. This involves splitting atoms to form lighter elements.

Fusion, which apparently causes the heat of the sun and which accounts for the tremendous power of the hydrogen bomb, is just the opposite; it involves transforming the atoms of a lighter element into those of a heavier one. Dr. Bhabha concluded: "... When that happens the energy problems of the world

will have been solved forever, for the fuel will be as plentiful as the heavy hydrogen in the oceans."

Could Run a Nation

While controlled fusion is apparently some years away at best, there was much at the meeting of immediate promise:

- The British announced that 15 tons of thorium could generate all the electricity that nation now gets from burning 40 million tons of coal a year.
- The Russians disclosed a 5000kw commercial (but obsolescent) nuclear power plant which they started operating some 50 miles from Moscow in June 1954.
- The U. S. declassified "any nuclear information not directly connected with military questions."
- The U. S. disclosed that in June 1954 it had purposely exploded a small water-cooled water-moderated reactor by cutting out all safety devices and removing all control rods. Scientists warned that any system can be defeated by a great enough fool.
- The British disclosed that they had been able to breed twice as much plutonium as they consumed in a small (top-hat sized) reactor.
- The Russians (who had an elaborate exhibit) sketchily described plans for a 100,000 kva commercial power plant.
- Admiral Strauss announced that the U. S. will sell (at what the British called cut prices) purified uranium.

^{*}Thorium is less expensive than uranium. Largest deposits are in India. In a breeder reacter, non-fissionable thorium is transmuted into uranium-233, which is a highly fissionable isotope of uranium-235. Thus the reactor breeds more fuel than it consumes.

FLOODS: Hit N. E. Plants Hard

Nation's brass mill output cut 25 pct . . . Thousands are out of work . . . Rail transportation snarled . . . Return to normal will take weeks, months in some cases . . . Steel mills flooded.

◆ FLOOD DAMAGE to metalworking industries in the 8-state area ravaged in the wake of Hurricane Diane will run into unestimated millions of dollars.

Among the hardest hit sections last week was the Naugatuck Valley in Connecticut where at least 30,000 workers were left unemployed. Brass mills in Ansonia, Torrington, Bristol and neighboring communities account for almost 50 pct of U. S. brass mill production. Delays of weeks (months in some cases) before mills can resume full production will seriously affect industry at large.

The American Brass Co. plants took the brunt of Naugatuck River flood waters. None of the firm's mills at Ansonia, Torrington or Waterbury is operating or shipping. All were hard hit. American Brass officials could not predict when production or shipments will be resumed at any of the three mills.

All Washed Out

At the plant of the Torrington Co., leading producer of needles, needle bearings and swaging machinery, officials estimate that it will be at least another thirty days before even partial production is resumed.

Other Torrington plants that were innundated include the Torrington Co., maker of oil burner blowers; Fitzgerald Mfg. Co., electrical appliances; Turner & Seymour Mfg. Co., foundry; and the Union Hardware Co.

Downriver at Waterbury, 40,000 tons of coal that had just been stockpiled at the Chase Brass & Copper Co. plant, were washed away. Total damage is estimated at approximately \$1 million and

an early report stated that it may take some weeks to get the plant back into full production.

The Scovill Manufacturing Co. main plant at Waterbury sustained no serious damage to mill facilities. But two smaller Scovill plants in the same area did suffer critical damage. Latest word is that the firm will switch to trucking service to compensate for shipping tieups because of crippling railroad damage.

Mills of the Revere Brass & Copper Co. and the Bridgeport Brass Co. in the area report no damage.

Boston Spared

In Woonsocket, R. I., the Taft-Peirce Mfg. Co., builders of special tools, reports that it survived the heavy wind and rain, although it may be five or six weeks before production is resumed at a nearby mill of U. S. Rubber Co.

In the greater Boston area, most factories escaped with minor flooding and are now back in operation. Among those affected was the Boston works of the Allis-Chalmers Mfg. Co. in Hyde Park.

At Worcester, Mass., about 3500 employees of the American Steel and Wire Co. will be unemployed for periods ranging from several days to several weeks. Flood damage to the plant is estimated at \$2 million, with the full extent still to be determined. Other Worcester plants that will be idle for an indefinite period include the Wyman Gordon Co., the Reed-Prentice Co. and General Electric's Telechron Division.

At Southbridge, Mass., home of the big American Optical Co. plant employing about 5000, damage was estimated at \$10 million. A \$250,000 loss was suffered at the Globe Tool and Die Mfg. Co.



FLOODS CAUSED havoc in New England where nearly 60 pct of U. S. brass mills are located. Scene is at hard-hit Waterbury, Conn.

CONTAINERS: Steel Supply Makes Dent

First half production for 2nd largest sheet steel consuming industry up 8.8 pct . . . Impending supply trouble cited as potential damper on total yearly output . . . Research projects increase.

◆ STEEL SHIPPING CONTAIN-ER producers—the nation's No. 2 users of sheet steel—chalked up an 8.8 pct rise in drum and pail output the first half of this year over the same period last year.

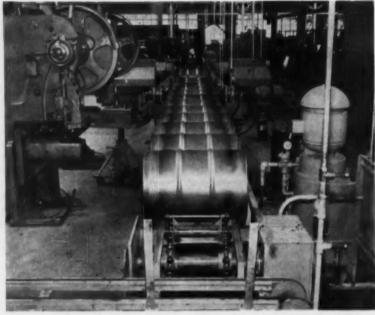
Just-released figures from Commerce Dept.'s Bureau of the Census show that over 53 million heavy and light gage drums and pails were turned out the first 6 months of 1955 as against 48,819,541 units produced in first half 1954. The Steel Shipping Container Institute pegs the rise in part to: (1) greater emphasis on container linings and surfaces, (2) recent standardization of drum specifications, (3) expanding use of decorated containers.

Ranking second only to the automakers in annual consumption of hot and cold-rolled sheets, container fabricators currently take up around 1 million tons of sheet a year. And—like all major sheet consumers—they're facing expected cutbacks in HR and CR sheet allocations in the tight-supply days ahead.

Cite Problems

A spotcheck of some major producers shows: (1) the recent steel strike and uninterrupted sheet consumption by automakers has already put an appreciable dent in sheet allocations normally destined for container makers, (2) so-called "captive" container plants will be no better off than other hard-pressed sheet customers in getting raw materials in the weeks ahead, (3) tightest item to get hold of will probably be CR sheet which goes into the manufacture of lighter gage drums and pails.

While fabricators questioned don't look for priority allocations to be instituted, the expected cut-



HIGH-SPEED 55-gal drumline at new U. S. Steel Products Div. steel shipping container plant, Pennsauken, N. J., can turn out up to 600 drums per hr.

backs, they feel, will be a major factor in this year's total output picture. How big a factor has not been determined as yet.

Research Important

The Steel Shipping Container Institute cites petroleum producers, the chemical industry, food, and paint and varnish manufacturers as major container consumers. Research into new protective interior linings at SSCI's Battelle Memorial Institute, Columbus, Ohio, is a major SSCI effort to broaden consumer markets for steel drums and pails. "Synthetasine 200," a recent Battelle lining development, is said to be excellent for shipping alkali, detergents, chlorinated solvents, fatty acid, emulsions, and food.

SSCI and its 35 member companies, representing 95 pct of the industry's total production volume, spend thousands of dollars a year on new product research, new plant equipment and facilities. To clearly identify a new container as against one that has been reconditioned, the Institute is currently promoting a "Red-S" label campaign among new drum producers.

U. S. Steel Products Division's recently opened container plant at Pennsauken, N. J., highlights the industry's confidence in the future demand for steel drums and pails. It has an annual capacity of 3.2 million pails, 2.3 million heavy and light gage drums.

Expected to be in full operation this fall, the highly-automated facility will employ around 350 persons. It is the most recent addition to the Corporation's coast-to-coast container plant operation.

ATLANTIC CABLE: Links Continents

New submarine cable will be longest undersea phone link . . . Each cable will have record number of 52 amplifiers . . . Bell lab turns out units in new plant . . . Cable ready next year—By D. G. Picinich

◆ TWO THOUSAND miles of slender copper coaxial cable, bolstered by submerged amplifiers, will transmit transatlantic telephone calls in the first submarine cable linking North America and Europe.

The \$35 million transatlantic system—slated for commercial operation late next year—will be the longest undersea voice cable in the world and the first laid at depths found in mid-ocean. It will supplement radio circuits now in use and will have three times the present circuit capacity.

Owned jointly by American Telephone & Telegraph Co., the British Post Office, and the Canadian Overseas Telecommunications Corp., the system will provide 36 high-grade telephone circuits between the United Kingdom, Canada, and the U. S. It will extend some 2000 nautical mi in length, will be laid in depths up to 3 mi between Scotland and Newfoundland.

Construction Details

Each of the system's twin cables will contain 52 submerged voice amplifiers, or "repeaters." The longest submarine telephone cable now in use is less than 200 mi long and no cable contains more than four amplifiers.

Of the coaxial type, the new cables consist essentially of a copper tube through the center of which runs a single copper conductor, heavily insulated by high molecular weight polyethylene. In shallow waters, copper tape wrappings serve as protection against the teredo worm, a marine borer. Additional wrappings of heavy jute, steel armor wires for mechanical strength, and an outer wrapping of jute guard against corrosion and tremendous ocean pressures.



WORLD's first transatlantic telephone cable goes down into the sea from the deck of HMTS Monarch.

Shallow-water cable sections measure approximately 1% in OD. Intermediate sections, lying between shallow and deep-water areas, measure about 1½ in OD, while deep-water sections are approximately 1¼ in OD. Over-all, the coaxial portion of the cable measures some % in diameter.

Open New Plant

Bell System's production arm, Western Electric Co., at its Hillside, N. J. laboratory is turning out cable voice amplifier components, meticulously designed to withstand the corrosive, 6500 psi challenge of mid-ocean pressures.

Opened last fall, the 43,000 sq ft site boasts of its hospital-like clean-liness, and of workers with toolmaker skills. Here, over 50 amplifier parts are tested and assembled, held together in an 8-ft "sausage" of 17 lucite links in a double casing of steel rings.

At each end of the "sausage" a water-tight seal is affixed. First, a metal-to-glass enclosure, next a plastic seal molded to the cable insulation, and finally a 7-ft long seal

formed within a copper tube which is an extension of the housing and provides a transition between the amplifier and cable.

Severe Tests

To make certain of the stability of amplifier parts during their long working careers—estimated at 20 years or more—they're put through temperature test cycles ranging from room temperature down to zero°F., up to 150° above zero. Detailed records are kept on materials used and all test reactions are carefully logged.

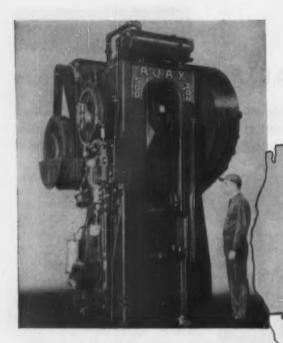
Ocean Tested

Before shipment to England and consignment to the ocean floor at 40 mi intervals, assembled amplifiers are tested in 80-ft cylinders which duplicate ocean pressures. Finally, they're covered with a protective armor wiring extending at each end of the "sausage" for later splicing into main cable lines.

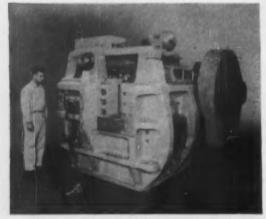
Bell technicians are satisfied that the final product will stand up under the most severe weather conditions and have been specially designed and tested to withstand marine life.



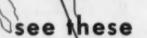
BELL technicians constantly check the transmission measurements on the amplifier test models. Vacuum tubes are core of the equipment.



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THE IRON AGE

Escape:

Ejection seat carries pilots to low altitudes.

Pilots baling out of jet planes may soon have a safer, easier trip to the ground. A new ejection seat carries the pilot to low altitudes, then casts him loose for conventional parachuting to earth.

Seat is the principal element in a new ejection method designed by Douglas Aircraft, working with the Air Force. Used only in research planes so far, the method provided downward ejection of the pilot and control of his flight immediately after leaving the plane.

Fins Stabilize

In high altitude ejections, the pilot rides down to 15,000 ft in a seat assembly that has stabilizing fins and carries an oxygen supply. If the bale-out is at low altitude, pilot and his chute are cleared from the seat within 3 seconds. Two hand movements trigger the automatic sequence.

One of the chief aims of the method has been to provide a stable ejection flight. The human body can withstand forces involved in supersonic bail-outs if the body is seated upright in relation to the path of flight. Stability has been obtained through the use of fins which are designed to maintain proper flight position in the different speed ranges encountered.

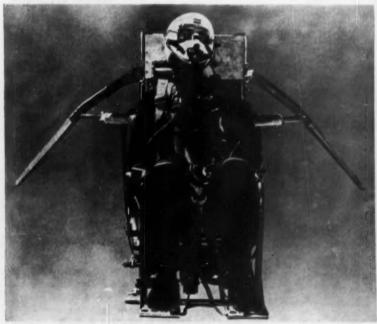
Install Polar Radar

Tons of special equipment for the distant early warning (DEW) line that will span the roof of North America are now being moved into more than 50 locations above the Arctic circle.

Two U. S. task forces with a combined strength of 3000 troops are working their way into the barren country via Alaska and the Atlantic. They will man some 37,000 tons of cranes, bulldozers, forklift trucks and other handling equipment to maneuver 200,000 tons of heavy equipment.

To take advantage of the short Arctic summer, the two seaborne expeditions set out from Seattle and Norfolk, Va., in July.

DEW line construction is a joint U. S.-Canadian project.



EJECTED: Jet pilot travels to low altitude in Douglas Aircraft's new ejection seat. Pilot is cast loose at 15,000 ft, parachutes rest of the way. Part of a downward ejection system, seat has side fins for stable flight.

Wages:

Northern soft coal miners win \$2 increase.

The substantial pick-up in the coal industry over the past 6 months has enabled John L. Lewis to effect a bloodless agreement with Harry M. Moses, President, Bituminous Coal Operators Association, calling for a \$2 a day raise. Soft coal miners' wages in the North will go up \$1.20 a day effective September 1, and rise an additional 80¢ a day April 1, 1956.

The new agreement puts the basic daily wage of miners up to \$20.25. The agreement covers about 60 pct of the bituminous industry. The negotiations for the Northern contract will provide a pattern for the Southern group which usually follows suit on negotiations between Mr. Lewis and Mr. Moses.

Prices Will Rise

Industry vacations have been increased 2 days, so the vacation payment has been boosted from \$100 to \$140. Saturday rates, time and one-half, and Sunday takes double time in the new contract. The agreement runs for 1 year from Sept. 1, 1955; is open-ended in that it requires 60 days' notice from either party to bring about a termination on or after August 31, 1956.

Few Strikes

Commercial coal prices are expected to be increased quickly in order to make up for the higher wage costs. A large segment of the Northern mines is captive and belongs to steel companies. The recent steel price increase is believed to have included some provisions for the coal wage hike as indicated in The Iron Age of July 7.

Agreement continues precedent followed this year in most industries of settlement without strike. There have been some walkouts, but gains have been won with little strife.

Tunnels:

N. Y. Shipbuilding develops new assembly method.

New York Shipbuilding Corp.'s Camden yard has developed assembly line methods for building underwater tunnels. The new techniques were put into practice soon after the firm was granted a contract to build 9 twin tunnels, each 300 ft long, for Baltimore's \$130 million Patapsco River tunnel.

The process begins with the welding of steel sheets to form the outer "skin" of a 20 ft long tube. Six of the sheets, each 6 ft, 8-in wide, 34 ft long, are joined on a flat surface to form a single piece of metal 20 ft wide, 102 ft long.

The larger sheet then is turned over, welded on the opposite side, and moved to another work deck for attachment to circular T-beams. A specially-built "spider" or form, to which the T-beams are affixed, is rolled to one end of

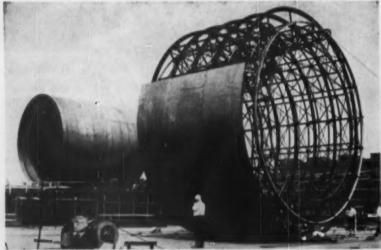
a steel sheet. As the "spider" is rolled forward, the sheet is welded to the T-beams.

Welders work ahead of the oncoming "spider" as other workers detach the frame from the beams as welding progresses. Result: when the last bead of weld is complete, the assembled unit is placed on end and lifted out by crane.

The "spider" then is placed back into position for assembly of the next section. The completed 20 ft unit is lifted to the ways normally used for ship construction and launching. Here, it is joined with other similar sections until a 300 ft long tube has been completed. Each tube section is constructed of \(^3\/_8\)-in. steel.

Launched Like Ships

On the same ways, adjacent to the completed 300 ft cylinder, a similar tube is assembled. Concrete is then poured at their underside to join them. Completed units are sealed with bulkheads at each end and are launched.



TWENTY-ft tunnel section is welded into place. Sections are for new \$130 million tunnel project at Baltimore.

J&L Plans New Mill

Jones & Laughlin Steel Corporation, the country's fourth largest steel producer, will construct in 1956 a cold finished bar mill at Willimantic, Conn. The company has bought 31 acres from the American Screw Company there. The site will be used initially for the bar mill which may suggest further expansion at a future date.

"This location will enable J&L to provide a maximum service to New England users of cold finish steels, now receiving shipments from our mills in Pittsburgh," said C. L. Austin, J&L president. Cold finished bars are one of the major products of the steel company.

Ammonia:

U. S. Steel Geneva Works seen as key source

Heavy construction is slated to get underway this fall on U. S. Steel Corp.'s Columbia-Geneva Steel Div. anhydrous ammonia plant near Provo, Utah.

This will be the first installation in a major steel plant in this country using raw coke oven gas as the source of hydrogen for ammonia synthesis, essential to national defense. It is expected to start a new trend in coal chemicals recovery and to provide a significant contribution to the economy of the Intermountain-Northwest areas.

The project will include a 200tons-per-day anhydrous ammonia plant; a nitric acid plant based on the oxidation of ammonia; a fertilizer-grade ammonium nitrate plant, and the necessary complement of auxiliaries.

The Works are expected to be a significant source for the expanding agricultural and processing industries in the closeby areas.



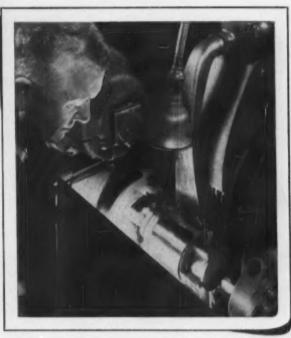
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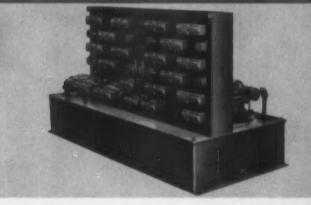
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PLANNING

Report To Management

Things Aren't Always What They Seem Don't be misled by the guaranteed wage talk stirred up by recent can industry labor pacts. Can companies granted supplemental unemployment benefits (SUB) extending 52 weeks. The initial SUB agreements at Ford and General Motors call for only 26 week payment periods.

At first glance new contracts look something like annual wage plans. Fifty-two weeks make a full year. But when you read the fine print, the time element boils to a question of distribution, not dollars or principles.

Employer liability under the new contracts is actually less than auto company obligations. American Can will contribute 5¢ an hour toward a \$3.2 million fund. Payments to workers cease when the fund is used up, decline as the kitty shrinks.

How Often Do Can Models Change? What makes the new contracts even less significant is the stability of the can industry. Can making is not a seasonal thing. Management took a good look at past layoff figures before

offering jobless help.

Some union leaders are looking at the same figures and talking down SUB. Spokesmen for an AFL affiliate told American Can to keep contingency pay; they want direct increases plus more holiday and vacation benefits. And you can bet the union isn't going soft.

That's why steel management is peeved by the action of the can industry. Steelworker unions now have SUB contracts to trot out at talks next June. They got these contracts from an industry not seriously involved in the issue of seasonal layoffs. Steel definitely has this problem.

No Rallying Round the Flag

You can forget any notion that industry will unite in resisting SUB or in securing an orderly application. Steel faces a pattern set by a stable production group. The same thing will happen to others if union strategy and contract timing dictate.

This doesn't mean SUB is inevitable right now. General Electric sidestepped a top union demand for guaranteed wages. But it cost them. GE gave electrical workers a 3 pct escalator clause plus immediate pay hikes.

Your chances of postponing unemployment benefits depend on how much the union stands to gain by SUB; how close you are to national union politics; how high you're prepared to go into direct pay and other benefits.

What To Watch

There will be more talk of "guaranteed wage" settlements. International Harvester has offered a \$15 million SUB fund. Chrysler faces demands for SUB coverage of office workers.

The point to examine in negotiations and settlements is liability. As long as payments come out of a definitely limited fund, there's no question of a guaranteed wage. Don't be stampeded by payment details: one week or 52—no one is guaranteeing wages right now.

Employee longevity is something else to watch and think about. The American Can contract requires 3 years employment before a man is eligible for SUB. Check your employment records and other company agreements. Exact knowledge on this point can make a big difference in SUB funds and contributions.

OR

REP

INDUSTRIAL BRIEFS

Largest Lab... The Air Force has announced plans for what will be this country's largest and most modern electronic and flight simulation laboratory. The equipment will be constructed by Reeves Instrument Corp., a subsidiary of Dynamics Corp. of America, and installed at Wright-Patterson Air Force Base, Dayton. The project, featuring operational amplifiers, computers and differential analyzers, is now underway and should be completed within a year.

Ultrasonic . . . Roberts and Randolph Ultrasonic Co. has been formed in Baltimore offering specialized service in ultrasonic cleaning and testing.

Automation . . . Talk-A-Phone Super Chief is a communications system available in either 10 or 20 station capacity featuring automatic controls. Conference calls are possible. Red, green and amber lights indicate whether the station called is busy, not busy or in conversation. Manufacturer is Talk-A-Phone Co., Chicago.

Double Header . . . Style 432 vertical precision boring machine made by Ex-Cell-O Corp. of Detroit features turning, boring, facing, grooving or chamfering on two pieces at the same time either in combination or as separate operations. There are individual controls and power equipment for both stations.

New Firm . . . Lawrence W. Wilson Assoc., Industrial designers has been formed to succeed the firm of George W. Walker in the Detroit area. The Walker organization disbanded when its head was elected to an executive post at Ford Motor Co. Wilson will handle all accounts formally with Walker.

Smelter Plans . . . Eastern Smelting & Refining Co. Ltd., of Canada plans construction of a smelter and power plant aimed at an annual capacity of 6250 tons of metallic output and 15,000 tons of copper blister. The tentative location is Chicoutimi, Quebec. Production in the \$20 million project is expected to start by July 1957.

Largest Load . . . What is believed to be the largest single ship load of iron ore ever brought into the United States arrived recently at the Cottman Ore Pier of the Canton RR in Baltimore from Puerto Ordaz, Venezuela. The 29,874 tons were unloaded from the vessel in 22 hrs and 45 min.

Nylon Synthetic Paper . . . The first commercial run of synthetic paper made from nylon fiber has been achieved by Riegel Paper Corp., New York. The synthetic nylon paper is reported to be stronger, with resistance to chemical attack, the action of molds, bacteria and light. Information from Riegel Paper Corp., 260 Madison Ave., New York 16, N. Y.

Job Planning . . . An on-the-job analysis of material handling at Caloric Stove Corp., Topton, Pa., resulted in a new method of adaption of splitting standard width of forks on lift trucks in half to match the channels at the bottom of each range.

Dehumidified Tankers . . . Kathabar Div. of Surface Combustion Corp. received an order from Cities Service for automatic dehumidifying equipment to be used in three 32,000 ton tankers. The vessels are being constructed by the Ship Building Div. of Bethlehem Steel Corp., Baltimore. Delivery is scheduled for October 1955.

Bids Invited . . . Bids for the construction of an aircraft refueling system and hydrants at Castle Air Force Base in Merced County, Calif., will be accepted by the Corps of Engineers on or about Sept. 6. Ten months will be allowed for completion.

Rolling Mills . . . Stanat Mfg. Co., N. Y., announced completion of negotiations with Albert Mann's Engineering Co., Ltd., Essex, England, for the latter to construct rolling mill equipment for sale in European and Commonwealth markets. The equipment will be made from designs furnished by the American concern and will be marketed under the Stanat-Mann label.

New Company . . . A newly formed company, Canto Tool of Ohio, Inc., will open its doors for business shortly in Cleveland. It will specialize in the design and manufacture of gauges, tools, dies and other precision products.

Revision Contract . . . The Dept. of Defense recently announced award of a contract for revision of its Directory of Metalworking Machinery to John M. Thorne Inc., Wash., D. C. Those inadvertently omitted, or having deletions since the last report are invited to submit complete data to the Assistant Secretary of Defense, Wash. 25, D. C., attn. of production and equipment branch. In addition to its primary purpose of inventory control, the directory is widely used as a basic reference in procurement activities.

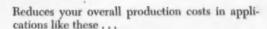
Sales Agent . . . Sales of Jones & Lamson Optical Comparators in Indiana will be handled by Clark & Osborne Co., Indianapolis. The agreement excludes six counties in the north and nine in the south of the state.

Users of tubing for cylinder applications now you can have this new...

J&L Cold Drawn ELECTRICWELD

Tubing with a

ID Finish



- e cylinder tubing
- hydraulic and pressure tubing
- shock absorbers
- ordnance components

This new drawn-over-mandrel grade tubing with its mirror-like inside surface finish is today busy helping manufacturers reduce or entirely eliminate costly machining on many applications and is being substituted for more costly types of steel tubing. For example, it may be used, without inside honing, for many cylinders through which plungers are passed.

J&L Cold Drawn ELECTRICWELD Tubing with a Special Smooth ID finish combines the physical advantages imparted by today's modern electric welding techniques with those of cold working. It withstands high internal hydrostatic pressures, carries heavy torsion loads, resists high-frequency vibration, and offers a favorable weight-to-strength ratio for applications in which loading occurs in all directions.

J&I. Cold Drawn ELECTRICWELD Tubing can be furnished in its three specifications in OD sizes from %-inch to 2% inches and in wall thickness from 20 to 10 gage, 0.035 and 0.134-inch respectively.

This new booklet provides the information you need . . . , specifications . . . tolerances . . . chemistry . . . mechanical properties . . . annealing . . . finishes.

Send for your free copy today!

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Jenes & Laughlin Steel Corporation
Dept. 403, 3 Gateway Center, Pittsburgh 30, Pa.

Send me a copy of your new Cold Drawn ELECTRICWELD

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Company

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e Stote



Aluminum Gains Ground in '56 Models

Light metal will make inroads in both trim and functional parts . . . Diecast engine blocks are under test . . . Copper shortage forces aluminum substitutes . . . Chrysler Idea cars—By W. G. Patton.

♦ REPORTS PERSIST in Detroit that the 1956 model cars will make considerable use of colored aluminum grilles, door handles and trim molding, replacing, in some instances, stainless steel. The current crop of reports appears to be exaggerated, although a trend in this direction has undoubtedly begun.

There is a well-substantiated report that a major manufacturer will use a stamped aluminum grille. Available information indicates natural aluminum finish or simulated plating finish, rather than colors, will be employed.

There are also unconfirmed reports that another car producer is planning to use some aluminum trim later this year to replace stainless steel on a short run model. It is not known whether an anodized color finish will be used. Cadillac has been using a gold, anodized Al license plate bracket and an American Motors emblem is made of anodized Al.

All Shades . . . Colored aluminum finishes are not new, of course. Beautiful shades of gold, green, red, blue, and brown have been available for some time. One of the initial difficulties with anodizing was that the color was not light fast. It is understood this shortcoming has been largely overcome. Laboratory investigators agree that anodized Al has been showing up very well.

There can be no longer any doubt that aluminum is making important forward strides in the automobile industry. At the SAE meeting at Atlantic City this summer, a spokesman for one of the aluminum companies predicted the use of aluminum cylinder blocks, wheels, brakedrums, trim, grilles, knobs, clutch housings and even bumpers in the years ahead.

Copper Substitutes . . . Aluminum bumpers are already being employed for buses. One possibility that is now being investigated is extruded aluminum bumpers to compete with rolled and plated steel bumpers.

Meanwhile, the copper strike has given some momentum to the substitution of aluminum wiring for copper wiring. At least two car manufacturers are using aluminum battery cables. Extended use of aluminum wiring in automobiles has been predicted by a number of industry observers.

Where aluminum grilles are being considered, engineers seem to favor the use of stampings rather than die castings. This choice is dictated mostly by economics.

Future in Engines . . . Aluminum's big chance in automobiles will come, of course, when it becomes practical to diecast an entire automobile engine. Experimental cast aluminum engines now operating under test are reported to save at least 75 lb compared with a conventional engine.

Another application for aluminum in automobiles which is receiving considerable attention is vacuum metalizing. The process is reported to be much less expensive for some parts than electroplating, assuming buffing and polishing is required.



CLASSIFIED by its manufacturer, Chrysler Corp., as an idea car, Flight Sweep II features the closed-in effect. Full report page 175.

Unique Plastisols make metal finishing news

- ◆ Tough, thick, rubber-like chemical resistant coatings have opened up new opportunities for far better metal protection at lower cost . . .
- ♦ Application limitations overcome by vinyl compounds developed by United Chromium . . .

Plastisols are viscous, resinous liquids that take on a rubbery look and feel when baked. They form thick, chip-proof vinyl coatings with exceptional corrosion resistance, and high dielectric strength. In the past, application difficulties limited their use. But plastisols have become real production coatings now . . . applicable by almost any conventional method.

SPRAYABLE-EVEN UP TO 20 MILS THICK

The first practical sprayable plastisol, Unichrome Coating 5300 has extended use of plastisol corrosion control to large metal objects. Even ductwork and tanks, You can now spray seamless protection 20 mils thick per coat onto ordinary metals to fit them for severest service.

COLD DIPPING-3 TIMES FASTER

Unichrome Coating 4129 solves the problem of economical dipping of wire goods. It permits dipping at room temperature . . . 3 times faster than previous cold dip compounds, and using only half as much plastisol material. Refrigerator shelves, freezer baskets and the like are now getting the better protection of plastisols more economically.

In these two singled-out examples, you see what United Chromium strives to do with all its metallic finishes, organic coatings, dip finishes and equipment . . . to help you cut finishing production cost, or produce a superior product through a better finish. We'd welcome an opportunity to work with you.





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baby doing nicely

thank you!

FORGED ROLLS

The Ohio Steel

Figure 1 and 1

HARIDNÉSS STRENGTH UNIFORMITY CONSISTENCY

Chic Rolls
SHAPING METAL FOR ALL INDUSTRY



THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO . Plants at Lima and Springfield, Ohio

Automotive Production

(U. S. and Canada Cambined)

WEEK ENDING	CARS	TRUCKS
Aug. 20, 1955	145,647	23,902*
Aug. 13, 1955	151,505	24,317
Aug. 21, 1954	104,518	17,218
Aug. 14, 1954	102 736	16.472

*Estimated Source: Ward's Reports

Styling:

Chrysler Idea Cars court sports car fans.

The so-called "Dream Cars" offer probably the best opportunity that exists today to study future trends in automobile styling. Last week Chrysler Corp. introduced three of its new "Idea" cars, including a four-passenger sports convertible named Flight Sweep I, a four-passenger sports hardtop named Flight Sweep II and the Falcon, a low-slung two-passenger roadster.

The cars have been designed to attract American sports car fans although styling is American rather than European. Flight Sweep I is only 53½ in. high. This is 7 in. lower than the 1955 Plymouth. Overall length is 207 in. which is 3 in. longer than a standard Plymouth four-door sedan.

Curved Windows

This sports car is equipped with separately adjustable airfoam cushioned individual front seats and conventional rear seat.

The windshield slopes at 56 deg. The car has curved side window glass, fully flared wheel openings and a two-piece counterbalanced deck lid.

The Falcon is built on a 105 in. wheelbase and is only 51½ in. high. This car features externally mounted dual exhaust system, full wheel openings, and upswept rear fenders and recessed taillights.

Each car has fully automatic transmission, full-time power steering, safety power brakes and electric window lifts with many other added features.

Build "A"-Proof Plant

A \$4 million industrial plant designed particularly "to safe-guard employees and shareholders' investments from the dangers of atomic warfare" has been announced by the Cross Co., Detroit, builders of automation machinery and special machine tools.

The new Cross plant will be built on a 65-acre site at Fourteen Mile and Groesbeck, Macomb County, and will be constructed of materials designed to resist radioactive rays. The process of selecting materials that will resist atomic rays is now going forward.

In the new Cross building, waterpond roofs will appear as small lakes when viewed from the air.

Suppliers:

Murray Corp. leaves auto parts field.

The last automotive unit of Murray Corp., its frame plant in Ecorse, Mich., was sold last week to Dana Corp., completing the program initiated by Murray a number of years ago of "getting out of the automobile business." The reasons given out publicly for the change in Murray policy are (1) the tendency of the major automobile companies to make more and more of their components, (2) the tendency of the independents to do the same thing.

Murray Corp. is now operating a group of non-automotive plants.

Didn't Keep Up

Many Detroiters who have watched the gradual withdrawal of Murray Corp. from the automotive scene are inclined to assign additional reasons for the company's decision to leave the automobile business. These reasons include the intensive competition between vendors and Murray's reported failure in some of its plants to keep pace technologically with the rest of the industry. During World War II the company was plagued with a series of costly work stoppages, for example.

THE BULL OF THE WOODS

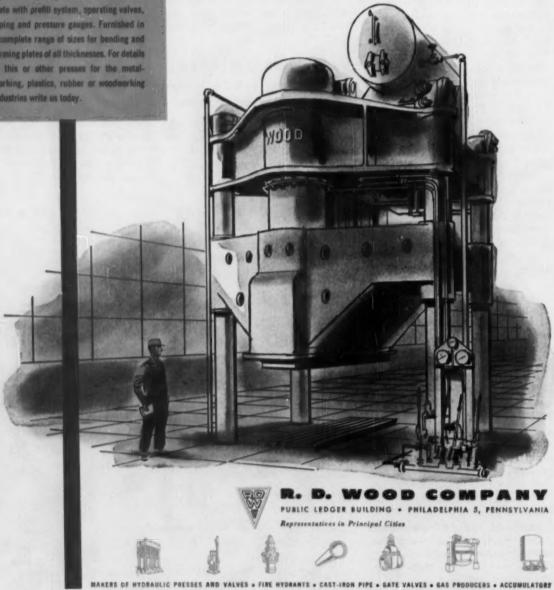
By J. R. Williams



1500-ton Heavy-Duty Forming Press for bending and forming operations on heavy steel plate. Moving platen can be tilted right or left during stroke. Furnished compiete with prefill system, operating valves, piping and pressure gauges. Furnished in a complete range of sizes for bending and forming plates of all thicknesses. For details of this or other presses for the metalworking, plastics, rubber or woodworking industries write us today.

You'll like what it does to production

It's just plain common sense-when your down-time decreases your production is bound to increase. Down-time can't be eliminated, but R. D. Wood presses hold it to a minimum. The meticulous design, choice materials and careful craftsmanship that go into a Wood press produce a superior producta dependable, smooth-working press that can't help but increase production records. Products with the Wood stamp of quality have been piling up production records for more than 150 years.





World Resources Face Growing Drain

Census shows births running way ahead of deaths . . . Reversed trend will bring world population to 7 billion in 70 years . . . U. S. must find raw materials for 221 million by 1975—By G. H. Baker.

• WORLD - WIDE population boom is putting the squeeze on supplies of metals, minerals, and other natural resources. At the present rate of growth, the United States and other industrialized nations soon will have a tough time supporting inhabitants at their accustomed scale of living.

In another 70 years, the world's population will rise from the present 2.5 billion to about 7 billion, it is estimated. Until fairly recently, births and deaths just about balanced each other. Now, daily births exceed deaths by approximately 78,000 and the spread is widening. The population is not only increasing—it is growing at an ever-rising rate.

U. S. Lives Well... The United States today supports comfortably nearly 166 million people. The Census Bureau estimates we'll have about 221 million people in our borders by 1975, and all available data indicate a steep climb in the rate of increase after that.

All these predictions point to the growing need for better and more efficient utilization of the world's resources. Unless a major catacylsm comes along to remove any excess population, industry in another 50 years will have to get a lot more mileage out of its raw materials than it does today—if it is going to survive.

Congress Irks Ike . . . President Eisenhower isn't bluffing when he threatens to call Congress back for the purpose of voting the much-needed highway program.

He is reported to be a little hot

under the collar over the Senate and House bickering that killed both his \$31.2 billion road program and his atomic "peace ship" proposal. But his congressional aides are advising him that the Democrats are not going to change their votes from "no" to "yes" and therefore a special session would be a waste of time.

Both the road program and the atomic ship proposal went down the drain when the majority leaders refused to support the White House requests. Republican support alone was far short of the needed majority of votes. "Support the President, Vote Republican," is the word being passed to the grass roots for 1956.

Ready Hoover Bills . . . Legislation geared to translate Hoover

Commission recommendations into definite action will confront Congress at its next session.

Nearly 200 bills, which will put into effect more than 100 of the commission's suggestions for improving efficiency in government operations, will remain "live" during the current recess and will be taken up for action next January.

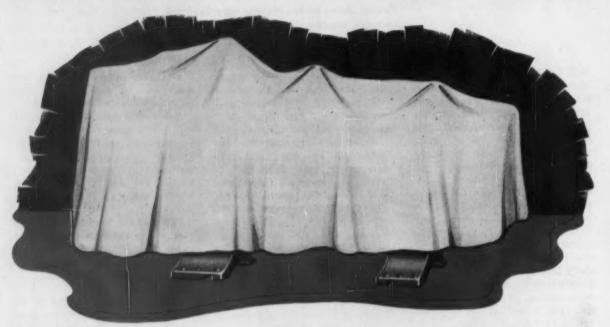
Putting the recommended improvements into effect now could mean a balanced federal budget, lower taxes, and a substantial reduction in the national debt.

Could Act Now . . . Not all of the recommendations require legislation. More than 100 recommendations can be put into effect at the pleasure of the Administration. Hoover Commission experts

WOCs Face Fishbowl Lives

- New provisions of the Defense Production Act require that an unpaid government official live in a fishbowl.
- Every 6 months, the WOC executive must submit for publication information on the names of any corporations in which he has been an officer or a director, or owns stocks, bonds, or financial interest. He must give the names of any other businesses or partnerships he has been associated with during the 60 days preceding his appointment.
- Prior to his appointment, the head of the department which is appointing a WOC must file for publication the name of the appointee, his private employer, and the position he will hold. The appointing officer must certify that no full-time government employee available is qualified to hold the job.
- Businessmen in Washington as WOCs are not permitted to make policy decisions, although they may advise on policy.

100% NEW BARDONS & OLIVER No. 4 UNIVERSAL TURRET LATHE to be unveiled . . . at the Machine Tool Show



SEE this new
Lathe in operation
at booth No. 325



EIGHTEEN SPINDLE SPEED CHANGES

THREE OPTIONAL SPINDLE SPEED RANGES-

AUTOMATIC ELECTRIC HEADSTOCK CLUTCHES

TWELVE FEED CHANGES—

SINGLE LEVER CONTROLS

INCREASED POWER AND RIGIDITY

FAST AND POWERFUL HYDRAULIC
COLLET CHUCK AND BAR FEED

Four other sizes of Turret Lathes as well as two sizes of Cutting Off Lathes, will be displayed by Bardons & Oliver, Inc. in Booth No. 325. <u>All</u> these machines have newly incorporated features.

MANUFACTURERS OF A COMPLETE LINE OF TURRET LATHES AND CUTTING OFF LATHES

BARDONS & OLIVER, Inc.

1136 WEST 9TH STREET

CLEVELAND 13, OHIO

are now working with the Bureau of the Budget to get this bracket of recommendations into effect at an early date.

Some improvements proposed by the commission are already in effect. The Defense Dept. has put into effect suggestions for improving its purchasing and inventorying of food. If the Pentagon doesn't backslide, it will cut its food costs by an estimated \$120 million annually.

Who Backs Reds . . . Who are the secret angels of Communism in the United States? Who pays the bills for some of the Red-inspired groups that operate in the shadow of industry?

President Eisenhower has just made it possible for Congress to find out. Scores of Communist-front organizations that now exist without visible means of support may have the financial rug jerked from under them within the next few months. Here's why:

Under the provisions of a new executive order signed by Mr. Eisenhower, the House Committee on Un-American Activities now has authority to inspect federal tax returns to find out the names of persons who "angel" Communist-front groups via the tax-deduction method. It's figured that the spotlight of publicity on some of the "angels" will cause them to think twice about their continued support of subversive groups.

At the same time, it should be noted that nearly all organizations on the Attorney-General's list of subversive groups have had their tax-exempt status cancelled, thereby forcing them to file tax returns.

Study Tax Write-offs

Mobilization officials are reviewing, one by one, fast tax amortization goals. Survey will last well into the fall, will probably bring reinstatement of many of the classifications recently frozen.

Basis for this belief is the firm hand with which Arthur Flemming runs the Office of Defense Mobilization. The ODM head is seen resisting curtailment of his tax write-off powers. The tax-am program originally set 225 goals. All but 77 of these had been closed out by this August. Under prodding from Capitol Hill and the Treasury, ODM recently closed 19 more goals and suspended application action for 38 others. Twenty types of new facilities are still eligible for tax write-off consideration.

Boom:

Peak production, other gains mark second quarter.

Gross national product soared to a new high annual rate of \$385 billion in the second quarter of this year, a healthy \$10 billion over the rate in the first 3 months. Almost all segments of the economy are sharing in the boom.

Latest figures from the Commerce Dept. show that gross national product (GNP)—total value of goods and services produced—in the second quarter of the year rose \$27 billion above the second quarter of 1954, and \$16 billion over the previous peak rate set in the spring of 1953.

Spending Rose

Fixed private domestic investment rose from the first to the second quarter by \$3 billion (annual rate), reaching \$56 billion for the first 6 months. Business expenditures for plant and equipment were



"Well, you wanted fast delivery. That'll be \$150, f.o.b. mill.

WASHINGTON NEWS

the major factor in this rise, turning upward for the first time since the beginning of the 1953-54 recession. All industry groups increased expenditures.

Manufacturing and trade inventories rose at an annual rate of \$4 billion in the second quarter. Personal consumption spending rose by \$5 billion to an annual rate of \$250.5 billion, the sharpest rise coming in non-durable goods. Personal income in the April-June period was at an annual rate of \$300.5 billion, \$7 billion above the rate in first 3 months.

One sour note; new housing starts dipped 11 pct in June, the first relative decrease this year.

Abuses:

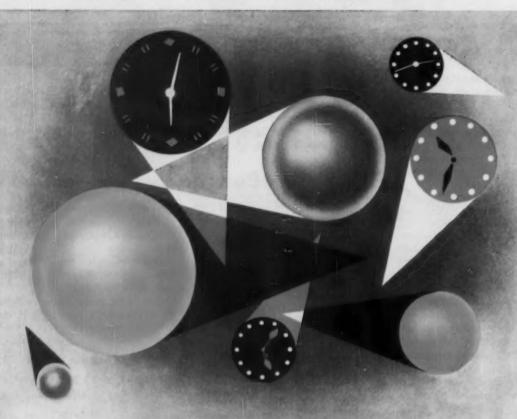
Senate group plans probe of welfare fund use.

Congress is likely to spend part of its time next year debating new bills that will call for better protection of beneficiaries of employee welfare and pension funds.

A Senate Labor subcommittee recently reported it had discovered financial abuses in two union-managed funds, plans new investigations. Without naming the programs awaiting examination, the subcommittee says it has received numerous complaints of misuse of funds.

Its chairman, Sen. Douglas, D., Ill., reveals one tack which may be taken in preparing legislation in 1956. There have been proposals, he says, that basic facts about the operation of welfare plans be disclosed to an "appropriate" government agency and to participating employers and employees.

Interim report of the Senate group denounced administration of the 65,000-member Laundry Workers' International Union fund, in Indianapolis, from which nearly \$1 million was reportedly embezzled in 3 years, and the Pointers, Cleaners and Caulkers Union Local 52 fund, Chicago. According to the report, \$220,000 was withdrawn from the latter without any accounting.



we can't buy it

We can't buy any more than the number of hours we are allotted each day or
the number of days of our years. Yet we have individual choice in the matter
of how we use our time—a choice that guides the outcome of our lives.
Industry has long known that the secret of success lies in taking advantage
of each unvarying minute. In that regard we'd like to tell you about the
Axelson lathe, the machine that helps your operators

work, not harder, but more effectively, so that each minute—each hour—is more productive. May we call on you?





See us at the Machine Tool Show in BOOTH 519

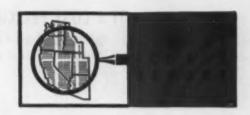


AXELSON MANUFACTURING COMPANY

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6160 S. BOYLE AVENUE, LOS ANGELES SE, CALIFORNIA

Dealers in Principal Tool Centers of the U.S.



Japan Scrap Hunt Extends to Gulf

Scrap hungry Japanese steel mills search West and Gulf Coasts for scrap sources... West's percentage declines... 30 pct of Orient scrap for steelmaking furnaces will come from Gulf—By R. R. Kay.

◆ WEST COAST ports—which handled some 90 pct of scrap shipments to Japan last year—will be processing only about 70 pct of the volume this year.

Tonnagewise, though, this could actually be an increase in business here. For Japan expects to boost her U. S. scrap purchases from last year's 350,000 tons to about 500,000 or more in 1955.

But, because of the tightening scrap situation on the West Coast, Japan is looking to Gulf ports for this commodity. She is trying to get at least 30 pct of her 1955 scrap needs through either New Orleans or Houston.

Stumbling Blocks . . . This was disclosed in a San Francisco interview with The Iron Age by Mr. Chubei Itoh, former president, now adviser to C. Itoh & Co. The Itoh firm is one of Japan's largest import-export organizations.

There's big doubt whether Japan can get the scrap at Gulf ports. At best, the area doesn't generate too much. Other stumbling blocks: (1) dearth of Orient-bound bottoms from East Coast ports; (2) higher Gulf vs West Coast scrap prices.

Of course, Japan prefers to buy on the West Coast. Shipping costs run some \$4 to \$5 per ton less than from Gulf ports. Since the average cargo runs 9000 tons, there's a whale of a saving. And delivery is much faster.

Japan is eager to confine her purchasing to Nos. 1 and 2 heavy melting grades. However, she is accepting some lower grades to make up shipments.



MULTIPLE-SPINDLE, semi-automatic boring fixture, developed by Northrop Aircraft and Angle Computer Co., handles 7 high-precision holes at a time.

Japan is hard-pressed for the stuff. What is she doing with all the scrap? Making steel principally for her rebuilding program: heavy construction work, ship-building, and railroad equipment.

Cut Machining Time . . . Want to slash boring time on hard-tomachine castings, stampings, and forgings?

Here's a tool setup that whacked a 10-hour job down to 45 minutes.

It's a multiple-spindle, semiautomatic boring fixture — can handle seven high-precision holes at one time. Locating pins hold the part to the boring fixture, assure positive indexing, high accuracy.

It operates like this: Boring

bars rotate in a fixed position—work travels to the bars. In a single pass, boring bars rough cut and finish bore seven holes. At least three separate passes are eliminated: for rough, semi-finished, and finished cuts.

The trick: each boring bar has two cutting tools, one in front of the other. First tool makes rough cut; second, finished bore. Machine shuts off automatically when holes are through.

Northrop Aircraft, Inc., Hawthorne, Calif., and Angle Computer Co., Inc., Glendale, Calif., developed the equipment to bore rocket pod holes for Northrop's F-89 Scorpion jet fighter. Company cuts 91/4 hours off 10-hour drilling job on concave castings.

IT'S COST PER CUT THAT COUNTS!

What is the cost of band sawing? What is the cost of hack sawing?

Let's Find Out in Truth

Many people are currently confused by conflicting claims and socalled "production records" of band saw machine builders and hack saw machine builders; and it is timely that the "air be cleared."

As the ONLY American manufacturer who has uninterruptedly built and sold BOTH metal-cutting band saw machines and hack sawing machines for more than 37 years, we have decided to boldly "clear the air."

In our Booth No. 416 at the Machine Tool Show, Chicago, September 6th to the 17th, an internationally known firm of test engineers will publicly conduct an unbiased fact-finding test. Under their complete control, a band sawing machine employing high speed steel bands, and a hack sawing machine employing high speed steel hack saw blades will be run continuously on identical work under fixed and rigidly maintained conditions. The result of their unbiased findings, after the conclusion of the test, will be published and distributed to all persons who make request at the Show.

Both the hack saw and band saw machines to be run in this test will be new MARVEL models, undergoing their first showing, unquestionably capable of running the blade at the highest speed and the heaviest feed that any saw blade will withstand with reasonable and practical blade life on the test bar selected. The test engineering firm will select the blades to be used from available stock of various brands.

Every precaution will be taken to conduct the test on a strictly unbiased basis. We do not care which way this public test may turn the tide, for we, alone, build both types of machines — band saws and hack saws. We therefore boldly sponsor this test, seeking truth.

Be sure to see it - BOOTH NO. 416-The Machine Tool Show.

Of course, our full line of MARVEL saws will also be demonstrated in operation, to the extent that the limited space allowed us will permit. Other machines, not possible to exhibit in our crowded booth will be available for demonstration at our Chicago plant.





Will Sales Spurt After the Show?

Builders are making strong case for latest equipment . . . Orders jumped after last exhibit . . . But analysts differ on show's immediate sales effect . . . Long range benefits sure—By E. J. Egan, Jr.

♦ MACHINE Tool Show in Chicago next month will place heavy emphasis on the production advantages of 1955 metalworking equipment over machinery that may be only 2, 3 or 5 years old. Whether this major attack on obsolescence will pay off with a significant upturn in new orders remains to be seen.

It's a certainty that the industry's sales figures in the months ahead will be carefully scanned. Economists, market analysts, and just plain "second guessers" will eagerly watch for the statistics on new orders and shipments that come from National Machine Tool Builders Assn.'s Cleveland head-quarters each month.

Some Expect Rise . . . Judging from what happened after the last show in 1947, some observers might expect an immediate rise in new orders. In the September show month that year, new orders for metal cutting machine tools totaled \$18.9 million.

In October they climbed to \$24 million; in November they slipped off to \$22.4 million; and in December they again rose to \$24 million. But since none of these post-show totals were new highs for that year, some analysts credit normal fall activity for the upturn, discounting the show's effect.

Buy Machine Company . . . If its stockholders approve of the idea, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., will acquire the Cincinnati Bickford Machine Tool Co. and the Kaukana (Wis.) Machine Corp. Proposal calls for G & L to buy all the outstanding capital stock of Cincinnati Bickford, and to exchange common shares with Kaukana Machine.

Acquisition of the two well known firms would expand G & L's operations and diversify its product lines considerably. Major G & L products are heavy duty machine tools, such as horizontal boring, drilling and milling machines; planers; planer type milling machines; vertical boring mills; vertical turret lathes; and the line of Davis cutting and boring tools.

Cincinnati Bickford is a leading builder of upright and radial drills, while Kaukana Machine makes portable universal drilling and tapping equipment. The latter firm also has a large foundry operation, which the G & L man-

agement considers highly desirable for the 3-way integration, although all three plants will continue to work in their present locations.

Germans Buy Plant . . . Some U. S. machine tool builders may soon have the pleasure of tagging outgoing equipment with this notation: Ship To: The Volkswagen Automobile Works, New Brunswick, N. J.

Studebaker-Packard Corp. headquarters at South Bend, Ind., and Volkswagen Works officials at Wolfsburg, Germany, have both confirmed sale of Studebaker's former jet engine parts plant at New Brunswick to the German firm. The 400,000 sq ft factory was built in 1951, employed 500 people at peak production, but has been idle for the past 15 months.

Sale price for the idle plant, which is situated on a 165-acre tract, is reported to be about \$4 million. Acquisition of the property would seem to be ideal for Volkswagen's plans to capitalize on the growing popularity of its economical rear-engine car among U. S. motorists.

And the fact that the plant contains no tools suitable for auto production or assembly seems to leave the door open for business-hungry machine tool builders.

It is reported that the only surefire, "Made In Germany" items slated for the New Brunswick project are the dies that will form the Volkswagen's major components. The presses to accommodate these dies will apparently be purchased new.



EASTERN TOOL AND STAMPING CO.



Typical example of 1-piece stamping from 1/6" thick by 73/4" diameter brass blank.



Here is a one-piece stamping that makes up into a hand stapler part.

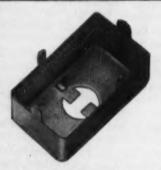
STAMPING **SPECIALISTS** IN DEEP DRAWING WORK - ALL METALS - ALL INDUSTRIES



Typical intricate one-piece stamp.



Notice the reduction in this 41/4" long by 1/2" O.D. tube with 11/4"



Difficult switch part for automotive industry.



Bulb base for photo flash lap and seam produced by high-speed process.



Intricate vibration mount parts for



Spring tempered phosphor bronze switch contact - note flat fold-back feature.



EASTERN TOOL AND STAMPING CO., Inc.

DIES AND STAMPING

SAUGUS

MASSACHUSETTS

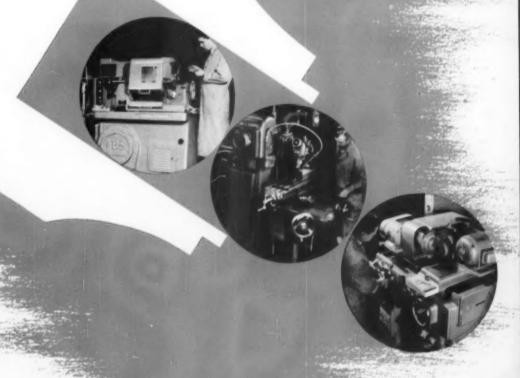
On all fronts
by Brown & Sharpe

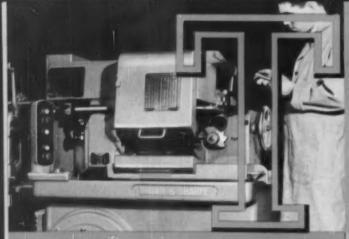
NEW screw machine productivity

NEW milling flexibility

NEW grinding versatility

NEW ease of precision measurement



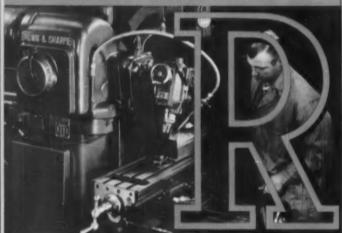


he Fastest

as much as 60% higher output

Advanced-Design Screw Machine Tools!

. . . new convenience, capacity, and ruggedness.

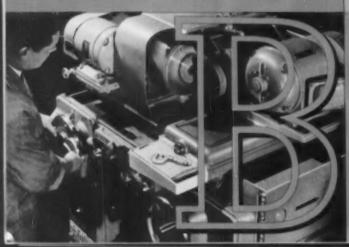


angemaster!

unique new milling machine with unusual range

Sensational Rubber-Flex* Collets!

... a "super-grip" for Brown & Sharpe
Nos. 0 & OG Automatics
and the O Hand Screw Machine



rand-New

new horizontal-spindle face grinder combines exclusive operating and production features

Automatic in its Range!

The new Brown & Sharpe No. 00 Automatic Screw Machine. The most advanced automatic on the market for stock up to ½" diam.! Push-button controlled. Speed range from 7200 to 34 rpm with 208 spindle speed combinations. Turning length to 1"; up to 1½" with extra equipment. Carbide tooling where desirable.

See this dynamic Brown & Sharpe advance at the Show!

Nine new 00-size Brown & Sharpe Screw Machine Tools loaded with extra-efficiency features! Illustrated Style 4 Box Tool with exclusive micrometer scale graduations is typical.

All nine tools feature increased capacity to ½" max.; faster, easier adjustments; greater strength and durability. See this dynamic Brown & Sharpe advance at the Show!



New Brown & Sharpe No. 20 Universal Milling Machine—Sliding Head Type.

Creates a new work-range concept for a single machine! Simplest machine of its kind to set up and operate! Vertical spindle utilizes full power on all work; has 18 speed changes from 80 to 3060 rpm. Exclusive features: Quill feed and universal movement give 360° range in two planes without extra attachment. Head swings out of way on crane when idle. Both spindles on same vertical centerline. Massive 22" ways for sliding head. Sustained high-accuracy milling in any work position! Also available as No. 20 Plain Milling Machine. See this dynamic Brown & Sharpe advance at the Show!

The revolutionary collets with a far more powerful, more uniform grip than conventional spring-type collets! Steel inserts, permanently bonded to rubber, actually "tighten" their grip as power of a cut increases. Each collet has .050" range.

Set of only 13 covers spindle capacity from .100" to .750"!

See this dynamic Brown & Sharpe advance at the Show!

*Rubber-Flex is a trademark of the Jacobs Manufacturing Company.



Angle!

The new Brown & Sharpe No. 11 Face Grinding Machine. A brand-new approach to grinding of flat, concave, or convex surfaces! Handles work up to 10" in diameter and 43/4" thickness. Horizontal work axis assures highest quality surface.

Fast lever-controlled chucking. Set-diamond dressing. Pre-set grinding and dressing speeds.

See this dynamic Brown & Sharpe
advance at the Show!

Brown & Sharpe 185

INVESTIGATE OUR PAY-AS-YOU-DEPRECIATE MACHINE TOOL PUBERASE PLAN



merica's Most-Advanced Vernier Caliper!

... eliminates
reflections,
cuts reading and
aligning time

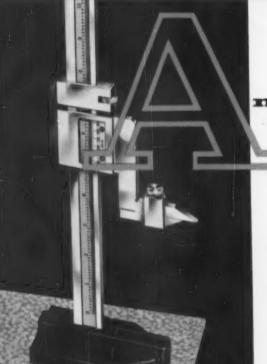
Here's the most easily-aligned, most easily-read, most durable Vernier Caliper! Jet-black, machine-cut graduations and figures on dull-chrome, recessed background give extra-vivid contrast without reflections. New Super-Vernier Plate is twice as long... twice as easy to read! All bearing surfaces protected by hard chrome finish. See this dynamic Brown & Sharpe advance at the Show!

Brown & Sharpe

Brown & Sharpe Mfg. Co. Providence, Rhode Island



MILLING MACHINES
GRINDING MACHINES
SCREW MACHINES
CUTTERS
MACHINE TOOL ACCESSORIES
MACHINISTS' TOOLS
ELECTRONIC MEASURING EQUIPMENT
JOHANSSON GAGE BLOCKS
PERMANENT MAGNET CHUCKS
PUMPS



merica's Most-Advanced Vernier Height Gage!

... full use of scale to zero

... no need to invert marker An exclusive combination of high accuracy and ease-of-use for vertical measurement! Slotted base allows full use of scale to zero. Fixed top marker for over-surface work. For under surface, simply loosen clamp nut and slide bottom marker forward. Has Super-Vernier Plate and all the high-contrast features of the Vernier Caliper. See this dynamic Brown & Sharpe advance at the Show!



The Iron Age

Milburn A. Hollengreen He knows machine tools and knows how to put modern methods to work saving time. A decisive, capable leader, he has been a fine president for NMTBA in a year of big decisions.

"We can't get him to rest." Chicago reports on the Machine Tool Show say Milburn Hollengreen has been a dynamic figure in preparations. The president of National Machine Tool Builders Assn. is right in the thick of things.

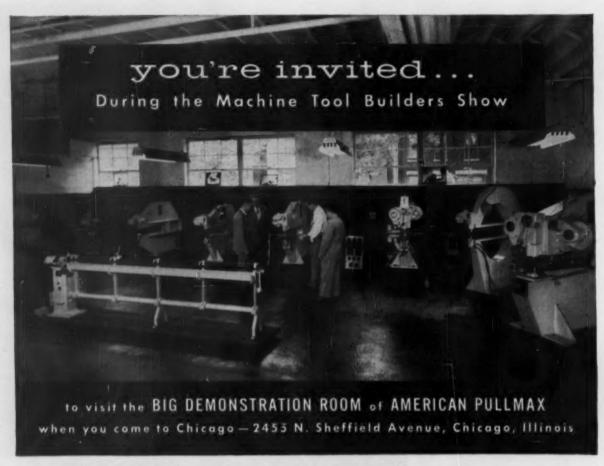
Many men have contributed to the massive Chicago operation. One of Mr. Hollengreen's big concerns has been that the show committee should receive full credit for their work. But there's no question NMTBA has been fortunate having Metz Hollengreen at the helm this busy year. Months of large and small decisions have found builders led by a man of decisive action. A big program has raced forward.

Back at Landis Tool Co. in Waynesboro, Pa., they have come to expect rapid-fire results from company president Hollengreen. You go into the executive office at Landis and see an uncluttered desk. The man behind it is genial but businesslike. Conversation moves briskly as questions are filled in by department heads talking through a system of concealed loudspeakers. A plane stands by, ready to fly Mr. Hollengreen to the company's Wisconsin opera-

tion. These modern touches are not window dressing—they save time. And they don't indicate any remoteness from machine tool fundamentals. Mr. Hollengreen can go down into the plant and talk design details. His name is on 23 Landis Tool patents.

His interest in machines goes back to early summer jobs in railroad shops and led to engineering studies at Cornell. He received an ME degree in 1926, went to work that same year as a service engineer for Landis Machine Co. in Waynesboro. He came to Landis Tool in 1936, as assistant general manager, became vice president in 1940, president and general manager in 1948. When Landis acquired Gardner Machine Co., he assumed like titles with the Wisconsin firm.

Mr. Hollengreen is active in civic work, recently led a hospital expansion drive. He likes horses, keeps several Palimino for rides through the mountains near Waynesboro. He is a friendly man, on first name terms with Landis people; keeps supervisors advised of company plans at luncheons every 6 weeks.



you'll be AMAZED at what PULIMAX does in metalworking

1 machine can do all these jobs in your shop

Ask any Pullmax user and he'll usually say, "I don't know how we ever got along without it."

7 sizes of Pullmax out mild steel up to 1½". Pullmax does all the jobs shown here and generally pays for itself in three or four months by saving time, labor and material.



PULLMAX DOES ALL THIS WORK



















If you're coming to Chicago for the Machine Tool Builders Show, the Coliseum Machinery Show or the Production Engineering Show from September 6 to 17, don't fail to visit Pullmax.

We'll have an exhibit at the Coliseum (Booth 120), but we want you to visit our big display and demonstration rooms at 2455 N. Sheffield Ave.

See all of the different Pullmax machines, the largest line of its kind in the World Market. See them demonstrated (or operate them yourself). See them work all gauges and types of metal (or bring your own job in to have it done on a Pullmax.)

Find out for yourself why everyone's saying this is the most amazing metalworking machine they've ever seen.

> Pullmax Machines on Display at Booth 120 Coliseum Machinery Show, Sept. 6 to 17 Write for Tickets and Literature Today!

COURTESY CAR FROM LOOP HOTELS

Just call Diversey 8-5727 and one of our courtesy cars will pick you up at your hotel and return you after you've seen the Pullmax machines.



AMERICAN PULLMAX COMPANY, INC.

2447 NORTH SHEFFIELD AVENUE

CHICAGO 14, ILLINOIS

The Iron Age INTRODUCES

C. Guy Rivers, appointed technical sales engineer in the Philadelphia area, southern N. J. and Del. for E. F. Houghton & Co., Philadelphia.

Vern F. Peak, appointed director of personnel services at the Kaiser Steel Plant, Fontana, Calif.; while Richard L. Boorman was appointed director of cost planning; Bruce W. Grube, appointed director of management development and training; and Ronald G. Hohnsbeen as works accounting manager.

Theophil H. Mueller, appointed assistant to the president of the New Jersey Zinc Co., N. Y.

T. M. Neibling has assumed position of vice-president and manager of the eastern division, Armco Drainage & Metal Products, Inc., Armco Steel Corp., Middletown, O.

Paul Duncan, appointed Washington representative for H. K. Porter Co., and its thirteen divisions, Washington, D. C.

J. P. Mathews, appointed chief chemist, Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio.

Dr. Clarence M. Ablow, senior research mathematician, Boeing Airplane Co., Seattle, and Dr. Otto Heinz, research engineer, Bell Telephone Laboratories, have joined the staff of Stanford Research Institute engineering division, Stanford, California.

Joseph Holland, appointed sales manager of military products for AC Spark Plug Div., General Motors Corp., Flint, Michigan; Milton E. Stratton was appointed chief inspector; and Harry Lisiak, appointed superintendent of inspection of the manufacturing quality control programs.

John C. Mullarkey, appointed technical service representative, Oakite Products, Inc., Phoenix, Ariz.

E. P. Allis, former president of Louis Allis Co., appointed chairman of the board.

William Bohrer has joined the Wheelco Cleveland office of Barber-Colman Co., Rockford, Ill., as a sales engineer; Vincent Piedmonte has been assigned as Wheelco Branch sales manager at the Barber-Colman, Ltd. office in Toronto; and James Hind has been appointed a sales engineer at the Syracuse office.

Denny J. Smith, appointed division controller of the Blaw-Knox Equipment Division, Blaw-Knox Co., Philadelphia.

William A. Millard, appointed sales manager of the Webb Wire Division, Carpenter Steel Co., New Brunswick, N. J.

Fred I. Rowe, partner and general manager of the W. L. Johnson Construction Co. & Associates, Columbus, Ohio, appointed to Policy Committee for 1955-56 United States Chamber of Commerce.



J. T. VINBURY, appointed sales manager, The Abrasive Machine Tool Co., East Providence, R. I.



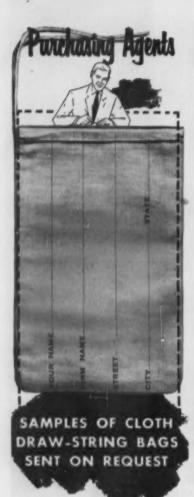
J. W. ALLIS, promoted to President of Louis Allis Co.



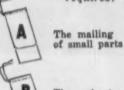
J. C. COONLEY, elected president and board member, Hydraulic Press Mfg. Co., Mt. Gilead, O.



F. L. WILHELM, elected asst. vice-president, The Rust Engineering Co., Pittsburgh.



If your operation requires:



The packaging of small parts for shipment with larger units

then you should investigate the ease and economy of using cloth draw-string bags, with or without shipping labels.

Send today for FREE Samples. We'll enclose our price list. And, of course, at no obligation.

MILLHISER BAG CO., INC.

Since 1870

403 STATE ST. RICHMOND, VA.

David C. McVey has joined Climax Molybdenum Co. in N. Y. as a sales development manager; Gordon Weller, has been appointed advertising manager.

William J. Matthews, Jr. secretary and treasurer, American Zinc, Lead & Smelting Co., elected vice-president of the St. Louis Control of the Controllers Institute of America.

Dr. W. A. Thomas, elevated to vice-president in charge of engineering, Electric Products Co., Cleveland; while J. R. Williams was made vice-president in charge of manufacturing; R. J. Berry, secretary-treasurer; and R. A. Morey, assistant secretary and treasurer.

Fred J. Meredith, appointed manager of Ford Motor Co.'s Cleveland Engine Plant No. 2; Thomas J. O'Neill, appointed executive director, sales and advertising staff; and F. J. Spittle, appointed manager of the dealer organization department; Robert C. Andersen has been appointed manager of methods, standards and administration department; C. Gayle Warnock, appointed public relations director, Chicago office.

Dr. David Albert Huffman, assistant professor of electrical engineering, MIT, will be awarded the Louis E. Levy Medal by the Franklin Institute of Pennsylvania, for his paper "The Synthesis of Sequential Switching Circuits."

Tom Fitch, president of Washington Steel, was presented with a wrist watch and banjo-type barometer from the company's union as an appreciation of gratitude.

Louis Martin, named general sales manager of the electronic tube div., Elmira, N. Y.; and Stanley Kemner, appointed manager of public relations, television-radio div., Westinghouse Electric Corp., Metuchen, N. J.



F. M. GRAUER, elected vice-president of Continental-Diamond Fibre Div., Budd Co., Inc., Newark, Del.



W. O. ROBERTSON, named vicepresident in charge of sales for Armco Drainage & Metal Products, Inc., Armco Steel Corp., Middletown, O.



E. L. DREYER, appointed president of Adamas Carbide Corp., Kenilworth, N. J.



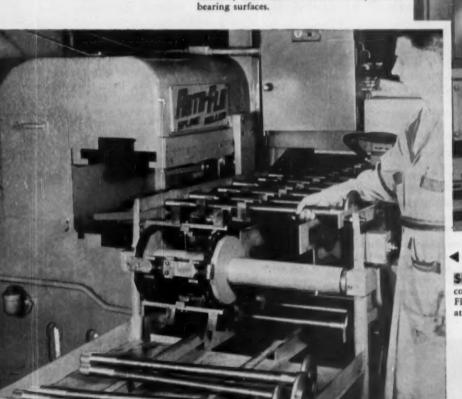
ABE HAGLUND returns to Azelson Mfg. Co. as sales manager, Milling Machine Div.

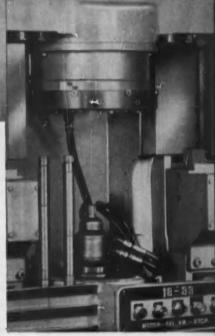


This Month's GEAR PIX

AUTOMATED SPEEDER... facilitates speeding of production gears in mesh with an accurate master or a master mating gear. Inspector places gears to be speeded in the chute, and flicks a lever to divert any rejects that exceed sound level requirements. Cycle time on helical gear shown is 6 seconds.

12 & 15 SECONDS, respectively, is the cutting cycle time for the ½" and 1½" width splines on an 18-33 Shear-Speed gear shaper. The 28-tooth, 24-pitch splines are formed on a relatively thin-walled hollow shaft adjacent to bearing surfaces.





SPLINES ON AXLE SHAFTS

cold formed automatically on the Roto-Flo spline roller. This will be on exhibit at the Machine Tool Show.



MICHIGAN TOOL COMPANY

7171 E. McNICHOLS RD. . DETROIT 12, MICH. IN CANADA: COLONIAL TOOL CO., LTD.



IRIDITE (Cast-Zinc-Brite)

brightens zinc die castings by chemical polishing, protects against corrosion

NOW, FOR THE FIRST TIME you can get a brilliant, decorative finish directly on zinc die-cast parts... without mechanical finishing, without electroplating! The luster is provided by the chemical polishing action of new Iridite (Cast-Zinc-Brite) solution. Even surface blemishes, such as cold shuts, are brightened by this new process. No electrolysis. No special equipment. No specially trained personnel. Just a simple chemical dip for a few seconds and the job is done. And, this new Iridite has been tested and proved in production.

CORROSION RESISTANCE, TOO! New Iridite (Cast-Zinc-Brite) provides exceptional corrosion resistance for bright-type chromate finishes . . . also guards against blueing or darkening by eliminating zinc plate formerly required in bright chromate finishing of zinc die castings.

AS A BASE FOR ELECTROPLATING—Lower mechanical finishing costs are possible where plated finishes are required since the brightness provided by this new Iridite may be sufficient.

LET US SHOW YOU what iridite (Cast-Zinc-Brite) can de for you. Send us at least a helf-dezen typical zinc die-cast parts for FREE PROCESSING for your own tests and evaluation. Or, for immediate information, call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified 'phone book. IMPORTANT: when you give us samples for test processing, please be sure to identify the alloy used.



Wallace S. Frank, appointed supervisor, process development unit for General Electric's silicone products department, Pittsfield, Mass.

Delmer C. Wright, appointed field sales representative for the Birmingham, Alabama territory of Laclede-Christy Co., Division of H. K. Porter Co., St. Louis.

Linford J. Wilson, appointed assistant comptroller, Wheeling Steel Corp., Wheeling, W. Va.

Norman C. Michels, to become vice-president of the Tennessee Coal & Iron Division of U. S. Steel Corp., Fairfield, Alabama.

Lee H. Witter, appointed director of salaried personnel of the Oldsmobile Div., General Motors Corp., Lansing, Michigan.

Lew Gilbert, appointed executive editor of Industry & Welding, and Welding Illustrated, Cleveland.

A. J. Mistler, named division manager of the Missouri-Kansas division of Armco Drainage & Metal Products, Inc., Armco Steel Corp., Middletown, O.

W. W. Mains, appointed vicepresident and manager of the southwestern division of Armco Drainage & Metal Products, Inc., Armco Steel Corp., Middletown, O.

W. P. R. Sceeles, promoted from sales manager to asst. to president, The Abrasive Machine Tool Co., East Providence, R. I.

S. G. Little, appointed asst. chief engineer of the GMC Truck & Coach Div., General Motors Corp.

OBITUARIES

Dr. William J. Hale, 79, research consultant, Dow Chemical Co.

Robert S. Page, president, The Henry Walke Co., Norfolk, Virginia.

George B. McC. Troxell, 60, sales manager, carbon bars, Bethlehem Steel Co., Bethlehem. Pa. RUGGED AND STRONG ... WINS FIN-UP DUTY



ATLAS CHAIN HAS TOUGHNESS TO "SPARE"

IN BOWLING ALLEYS Offsetting the extra work involved in strikes ... the bowling alley variety ... are pin-setting machines, built for rough, tough usage. Especially durable are the chains and sprockets which go into them, to stand up under the frequent, sudden and often jerky motions of each pin set-up.

One type of pin-setting machine made by Bowl-Mor Corporation handles the candle pins shown above. In it are more than 150 feet of various type of Atlas Chain, selected because of its toughness . . . its ability to withstand the repeated shock of suddenly applied tension and equally abrupt release.

Toughness in Atlas Chain is built-in . . . first by the composition of the steel used in plates, pins and bushings . . . then by skillful heat treatment which includes the Atlas exclusive "Ni-Carb" process. Pre-testing at more than 30 production points gives assurance of chain that wears longer, requires less maintenance . . . that is unsurpassed in general overall quality and performance.

If you use chain and sprockets you will find the Atlas Handbook ARC-54 helpful. Write for a copy today.

ATLAS CHAIN AND MANUFACTURING COMPANY DOYLESTOWN, PA.

ATLAS ROLLER CHAIN AND SPROCKETS





THE RIGHT SLANT. Her fashionable hat keeps its perky tilt, thanks to CF&I-Wickwire Hat Wire in the brim.

"NEITHER SNOW..." When the going's rough, drivers are thankful for tough, strong tire chains made of CF&I-Wickwire Chain Wire.

from holding smart hats in shape... to holding cars and trucks on snowy roads, nothing does the job like wire!

The dramatic variety of jobs that wire can fill—almost infinite in number—is encountered every day in hundreds of diversified industries. Shown here are only a few of the countless uses to which wire can be put.

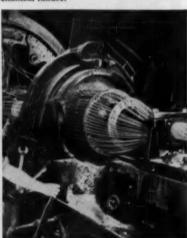
Wire, hair-thin to rod-thick, can be supplied with properties engineered to meet practically any need you may have for it. And CF&I-Wickwire Wire, with a century and a quarter of experience behind it, is ready to serve you by answering all your wire requirements.

Whatever you assemble, manufacture, or process, check into all the advantages you would gain by using CF&I-Wickwire Wire. You'll like doing business with CF&I-WICKWIRE, and the careful attention given your own particular requirements.

CF&I-Wickwire Wire is made in plants conveniently located from coast to coast. For detailed information, write our nearest district sales office.

SPEEDING AMERICA'S RECORD HOUSING PRO-GRAM. Stapling insulation to walls saves days of construction time and cuts building costs. CF&I-Wickwire Stapling Wire is used for all kinds and sizes of staples.

ALL WOUND UP. Here a submarine cable is being sheathed in CF&I-Wickwire Armor Wire for protection and resistance to mechanical failure.



DROPPING A MOUNTAIN with dynamite is accomplished with CF&I-Wickwire Fuse Wire for detonators.





IT'S CHILD'S PLAY to open today's sardine tins. Their sturdy key openers are made of CF&I-Wickwire Can Key Wire.

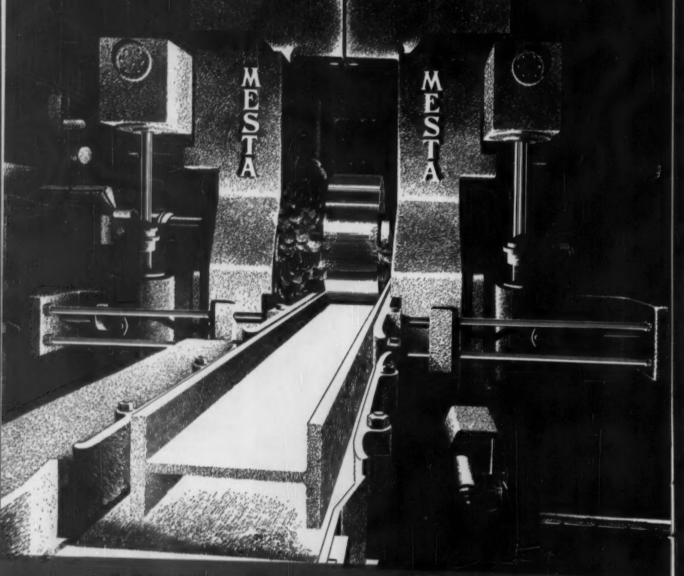
CFAI-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION—Alboquerque · Ameriño · Billings · Boise · Butte · Beaver
El Pase · Fl. Worth · Houston · Lincoln (Neb.) · Obleheme City · Phoenix · Pueblo · Solt Lake City · Wichite
PACIFIC COAST DIVISION—Les Angeles · Gehlend · Portiend · Sun Frencisco · Sentite · Speknee
WICKWIRE SPENCER STEEL DIVISION—Ablanta · Boston · Buffalio · Chicago · Detroit · New Orleans · New York · Philodelphila



WIDE FLANGE BEAM and STRUCTURAL MILLS





ALSTA from Mills being built for the Inland Shell Company, Indiane North World

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY - PITTSBURGH, PA



ELECTRICAL circuit trouble is located quickly from above the operations floor with this tracer panel and its "electric" pencil.



Automaker plans ahead-

Today's Tooling Decisions Must Meet Tomorrow's Needs

By C. J. Snyder
Vice President
Operations Manager
Chrysler Corp., Detroit

- Plymouth's new V-8 engine plant is one of the most modern in the auto industry . . . Here's a look at the many tooling innovations that were developed for maximum efficiency and flexibility.
- The author also takes you for a trip behind the scenes . . . He discusses the plans and decisions that have to be made before a tooling program of this scope and size can become a reality.

◆ TOOLING a modern automobile engine plant involves much more than coordinating the output of a group of machine tools and other equipment that will produce a certain number of engines per hr. In addition to meeting today's production requirements at competitive cost, the new facilities must also be adaptable to tomorrow's production requirements. The plant must be safeguarded against breakdown of production. Most important of all, quality must be built into production lines if the product and manufacturing costs are to remain competitive.

These are not, by any means, all of the con-

siderations that must be taken into account. Rather, these goals—(1) adequate production, (2) flexible production, (3) continuous production and (4) quality production—represent only the major targets in Chrysler Corp's tool engineering and planning. As will be seen later, many lesser objectives must be reached before there is any hope of accomplishing major objectives in tooling up for a new engine, or a new transmission.

Determining the facts—the true facts—is one of the most important jobs that is assigned to the firm's engineers. Experience has shown that



AUTOMATIC air gages classify parts by size and warn of approaching need for tool changes.

Some Plymouth Tooling Highlights*

Stop-and-go, pallet-type, engine-assembly conveyor with cutomatic transfer and indexing. · Elimination of stock-pilling and industrial truck deliveries to assembly line. • Cylinder bore sizes and piston sizes are tied in through automatic recording equipment. • Use of Barnes electrical circuit tracer-panel system. · Extensive use of cross-transfer between machine lines. . Down-draft cast Iron chip pit. · Use of large overhead cranes, eliminating need for beem cranes and access aisles. • Fully automatic crankshaft balancing machine. New, cam-type transfer bars. • Automatic loading, unloading and transfer of crankshafts through nearly all machining operations. • Use of double-deck conveyors for crankshafts. . Extensive use of assembly by machines, including connecting rods, piston pin and piston assembly: inserting plugs in rocker arms; assembling distributor drive gear and shaft. • Fully automatic engine testing.

*Probably the first time these things have been done in the automobile industry.

once all of the facts are established, the job of making tooling decisions is at least half done. It is understood, of course, that the job of getting the facts must include sound and imaginative evaluation of tooling and production trends.

Sound program considers future

Chrysler Corp, believes that no tooling program is sound that does not take into account the long range potential of the rapidly expanding automobile industry. Selecting equipment and developing processing methods that are satisfactory today is not enough. It is also important to look as far into the future as is humanly possible. That is why, in addition to selecting equipment, that will produce a satisfactory volume of quality parts NOW at minimum cost, the company has also given consideration to many other factors, including:

- Will production be safeguarded in case of a breakdown anywhere along the line?
- Can the new facilities be adapted to future changes in design.
- 3. Is maximum flexibility designed into the new equipment?
- 4. Will this equipment be adaptable to future developments in the mechanical handling of parts?
- 5. Is unnecessary handling being eliminated from the job?

- 6. Will the new tooling permit 100 pct inspection of production?
- 7. Can the new facilities meet the closer tolerances that will be required in the years ahead?
- 8. Does the new equipment take maximum advantage of the latest developments in electronic and other controls, automatic lubrication, tool changing, and maintenance techniques?

Although these are not all of the factors that must be considered, the list gives an indication of some of the problems, over and beyond satisfactory production rates and the costs of operation and maintenance that have to be taken into account in making tooling decisions.

The significance of many of these factors will become more evident as the tooling program for the new Plymouth V-8 engine plant is discussed.

The tooling up job for this new plant was accomplished in record time. This achievement was made possible by (1) sound planning and (2) the fine cooperation of several hundred vendors and suppliers. The first orders for machine tools were placed late in July and early in August 1954. Production started Aug. 1, 1955. Normally, at least 18 months is required to tool a modern, high production, automobile engine plant.

Even before the design of the new engine

was finalized, Plymouth engineers were working on their processing sheets. The prototype of the new V-type engine was used. Dimensions were added and changes were made as rapidly as engineering decisions were taken.

Prior to freezing the new V-8 engine design, requirements for good machining were set forth by Plymouth process engineers. For example: the advantages of a constant weight piston rod assembly were pointed out. Desired position of locators on the block was determined. One result of this kind of planning was that the engine block was designed for machinability—as well as for good performance.

Check "machining accessibility"

Similarly, locating points were designed into the head as well as into the exhaust and intake manifolds. The proposed head design was critically examined for machining accessibility.

During the entire planning period, two Plymouth tooling engineers worked constantly with Chrysler design engineers. As soon as a drawing was released, it was rushed to Plymouth for the development of tooling. It would be difficult to imagine closer—or more timely—cooperation between two engineering groups.

Actually, processing sheets for engine components were brought near completion even before dimensioned drawings became available. On some occasions, volumes were available at the Plymouth Div. before Chrysler blueprints became available.

Preliminary processing layouts were made



FOR speed and reliability, nuts are tightened by machine on this oil pump base.

almost as soon as the ink was dry on tracings at Chrysler engineering. However, before a single new part for the V-8 engine was ordered, it was completely processed.

Just as soon as dimensioned drawings became available, machine tool planning began to take final shape. The big transfer machines for processing blocks naturally came first. After placing these orders, machine tools required for heads, crankshafts and camshafts were ordered. These orders were in turn followed by the purchase of machine tools for miscellaneous operations on gray iron castings, rocker arms shafts, pistons, rods etc.

A very helpful step taken by Plymouth process engineers was to number each hole in the block. It was of great assistance to be able to refer to hole No. 176 in correspondence or over the telephone.

Another interesting step taken by the process engineers was to make what so-called "picture sheets"—drawings 10 in. x 12 in.—showing the locating point for every operation on every part. Position of the part and the machining feeds-and speeds to be used were also shown.

Because of the large amount of equipment involved and the early delivery date, the block line, for example, was broken into three major sections: broaching, holes and finishing. This simplified the process of obtaining bids and making final awards.

JIC standards were specified throughout the plant. Types of electrical switchboxes and other details were also specified. All electrical contact points were standardized. As a result, only two types of limit switches and two types of hydraulic equipment are used in the entire plant. The arrangement of dual suppliers not only offered protection against a vendors strike but it also afforded an opportunity to operate with a minimum repair parts inventory.

Early in the new engine program it was decided there would be a definite advantage if every tool could be changed by a workman standing on the floor. It was also agreed that hydraulic lines and equipment should be located overhead and outside of the machines whenever possible.

Each machine has own base

Another basic decision was that each machine must have its own base, and no bases that are common to several machines are used. Furthermore, the space between each machine is no less than the width of an idle station.

No machine in the new Plymouth engine line has tools working both horizontally and vertically. This provision affords maximum opportunity to make any future tooling changes that may become necessary.

Each base unit in the entire block line is interchangeable with every other base in the line. Thus, Station 2 in the line could, if desired, be moved to Station 10 and vice versa. Similarly,

"The new engine line was also planned for a maximum of maintenance accessibility . . ."

all 176 assembly fixtures on the engine assembly line are 100 pct interchangeable.

The new block line has 15 pullout stations where blocks can be cross-transfered from one line to another. Automatic storage between the two lines will also be provided and approximately ½ hour's supply of blocks will be carried in this automatic bank. There are no more than 20 machines in any one section of the line. This offers protection against breakdowns.

Change tools from floor

Accessibility for maintenance was another factor emphasized in planning the new engine line. Each tool is accessible from the floor. Also, there are idle stations between all machines. Where tools, such as drills, are used at an angle, extra long slides are provided to facilitate tool changes.

Capacity of the new Plymouth engine plant will eventually be three times the capacity of the equipment now installed and operating. But by breaking down the full job into three separate programs, several months were saved in getting production started.

Design for chip disposal is a major problem in planning any modern engine plant. And at capacity operations in the particular one, it is expected that a carload of cast iron chips and a carload of steel chips will be generated during each 16 hr working day. In most cases, chips must be disposed of automatically.

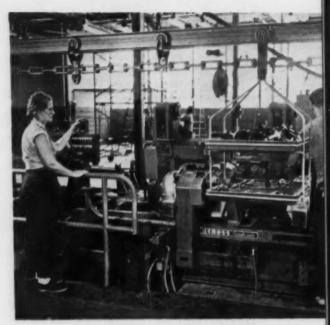
Cast iron chips are dropped through the hollow bases of the machines into a deep, concretelined trench where they are removed by a drag chain. To aid the removal of dust generated while machining cast iron, Plymouth engineers conceived this idea of using a V-shaped chip trench as a sort of flume. By applying a strong down-draft at 61 locations every 80 ft along the block line, dust is forced down instead of being carried up in the air.

Fans exhaust iron dust

A filter system removes dust from the air. Capacity of each of the blowers is 10,000 cu ft per min. The draft is strong enough to pull in air a considerable distance from each machine. Plant air—not outside air—is pulled into the machines, filtered and recirculated.

The chip trench has excellent accessibility; a man can walk the entire length of the pit. Between machines, openings are provided so that chips and dirt fall directly into the pit.

Steel chips are handled by a flush-flume system. Steel liners are used in all steel chip trenches. Chips fall through the base of the machine and into the pit. A pressure wash car-



TRAY conveyors bring small parts to the assembly line at the instant they're needed.

ries the chips to a 30,000 gal storage tank where they are removed.

A separate system handles aluminum chips, but all of the chip disposal equipment is designed to handle wet or dry material.

There is a single soluble oil storage tank for the entire plant. Distribution is broken down into 5 central systems. Mixing of soluble oil and water is done in each department rather than at the central storage tank. Thus, there is a separate system for camshaft grinding and another for crankshaft turning.

Hydraulic leaks at machines are caught in pans at the machine and do not reach the floor. All greasing is automatic. Oil mist is supplied as required from small pressure tanks.

The main sections of the Plymouth engine plant are serviced by one 5-ton and four 15-ton overhead cranes. These eliminate the need for access aisles and boom cranes to service the machines. Elimination of access aisles thus permits, for the first time in an automobile engine plant, the entensive cross-transfer of blocks, heads and automatic banks.

Operator control at the new plant is unusual in several respects. The operators stand on a bridge 6 ft above the machines with the two lines and twin operating panels in full view. Each operator controls 60 to 80 ft of the line. Colored lights tell which machines are operating. The operator can also watch for hand signals from the floor or he can talk through a 1-way communication system to the operating floor.

In planning the new Plymouth plant, electrical,

hydraulic and tool trouble men were selected early for the job. These men followed the construction of the machines from the beginning. They saw most of the machines built, watched their installation on the floor and were available to make adjustments during trial runs. This extensive training program has paid dividends in assuring rapid shakedown of the new machines. It also offers good insurance of trouble-free operation. Cooperation between Chrysler representatives and machine tool vendors was excellent during the entire construction period.

A Barnes electric circuit tracer system is being used by Plymouth. This is the first installation in an auto engine facility. By using an "electric pencil," bad circuits can be singled out quickly on the tracer panel, which is located above the floor behind the operator.

Hydraulic lines are located a minimum of 40 in. above the floor. This facilitates maintenance. All hydraulic valves are provided with a catch basin. Thus oil leaks are readily detected and repairs can be made quickly under most conditions with handy spare parts.



MUCH assembly is automatic, such as this operation on bearing caps and connecting rods.

Gages received a great deal of attention in planning the new layout. Sheffield automatic air gages are used at many critical locations to insure the quality of production. Gages show not only when a part is oversize or undersize; they also show when part sizes reach the danger zone and tool adjustments will be necessary. This arrangement obviously contributes much toward preventing the production of scrap parts since the gages actually anticipate this condition.

Tape records gage data

Another innovation is the recording of airgaged cylinder sizes on a printed tape. In this way, piston production by sizes is tide in directly with cylinder bore sizes. This arrangement should substantially reduce piston inventory.

Preset tools are used 100 pct and all automatic processing lines have tool control boards with counting devices. Preset tool boards, designed by Plymouth engineers, are used on all dial-type machines. A quality checking station follows each group of machines to make sure all required operations have been performed before the part continues along the line. For example, all holes (including oil holes) are probed before tapping.

Checks against "leakers" offer a further guarantee of quality. High pressure jets shoot a washing solution into a motor block or head that is rotated in a "ferris wheel" fixture. The turning device is indexed to present every possible angle to the 300 jets used to remove chips or loose sand in the casting. There is a jet washing station in each head line and three washers in each block line.

Whenever possible, tools are mounted in a horizontal plane. To accomplish this, it was necessary, for example, to machine the cylinder head, flat, on its side at a 15° angle and endways. And through certain machining operations the blocks are turned endwise, upside down and tipped at an angle of 18°. This permits the use, for the most part, of standard rather than special machine tools. In machining the manifold, ways are set at an angle on an otherwise standard machine.

Specify extra-rigid tools

Extra rigidity has been designed into the engine tooling at every opportunity. To mention an example: a double, cam-actuated transfer bar is used on a section of the block line. These double bars serve the dual purpose of lifting and transferring the block.

Another example is the Greenlee rough boring machines which feed at 20 ipm. This is more than double the feed rate at the firm's 6-cylinder engine plant. Special tooling and the extra rigidity of the machine make possible this increased rate of metal removal.

In all cases, feeds and speeds of machining operations were specified by Plymouth engineers,

"There is no trucking of stock along the assembly line . . . Counted parts are placed in special tray compartments and tray conveyors reach the line at just the right station . . ."

based on their experience with the materials being used in the new engine. All machining specifications were written so as to obtain the maximum amount of tool life with a corresponding minimum amount of downtime.

During recent years, Chrysler Corp. process engineers have given much attention to eliminating unnecessary handling, particularly of heavy parts like blocks and crankshafts. Benefits of this planning show up in the fact that there are only three locations where the operator handles the V-8 crankshaft.

Reduce manual operations

Where it was practical and advantageous to do so, manual operations were replaced by machines. This was done (1) to improve quality, (2) to standardize production rates, (3) to eliminate human errors and fatigue.

For example, all bolts and nuts on the new assembly line are tightened or loosened by machine. This is faster and more reliable. Nuts and bolts are started manually, however.

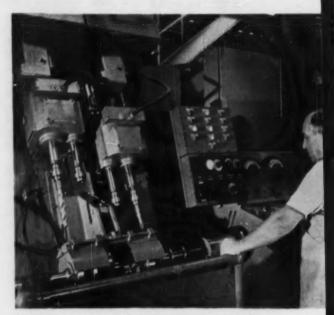
After the highest possible quality requirements for the new engine were met, cost and time factors were evaluated. The major savings in manpower at Plymouth will result from reduced indirect labor: (1) by eliminating unnecessary handling, (2) by efficient movement of parts between operations, (3) by eliminating unnecessary stock piles.

The new engine assembly line has a number of unusual features. The pallet-type, stop-and-go conveyor has automatic transfer and indexing. The engine is always stationary while work is being performed. This system avoids the use, for example, of nut runners that move with the conveyor. In designing the new stop-and-go conveyor, operations were balanced just as they are in a line of machine tools.

Synchronize part conveyors

Moreover, there is no trucking of stock along the assembly line. Miscellaneous parts such as nuts, bolts and washers are contained in trays that are filled by counting, hopper-fed devices. Counted parts are placed in a special compartment in the tray and tray conveyors are timed to reach the assembly line at just the right station. Actually, only 9 motorized vehicles will be used to serve the entire 530,000 sq ft plant when it is fully equipped and operating at maximum capacity.

Testing the Plymouth V-8 engines is entirely automatic. No manual handling of gas, water and oil connections is required. At capacity operations, 76 testing machines will function without human guidance except to record data and



FULLY automatic camshaft balancing machine locates and corrects any unbalanced condition.

direct engines to shipping or repair stations.

Newly developed machines are being and will be used to (1) assemble piston pins, connecting rods and pistons, (2) insert plugs in rocker arms, (3) assemble the drive gear and distributor shaft. Automatic nut running machines are used for bearing caps. Welsh plugs and several other parts are inserted automatically after machining operations. Assembly operations have also been added to transfer machine operations on the intake and exhaust manifold.

Emphasize automatic loading

Crankshafts are loaded automatically, two at a time, in LeBlond turning machines. The Fitchburg mills, Wickes crankshaft lathes, LoSwing lathes, Crankshaft Machine Co. lathes, Impco straightening machines, Snyder oil hole drilling machines, and Landis 5-wheel grinders are all loaded automatically.

Tools for steel operations have been designed to keep chips short and to break up long chips that might interfere with automatic chip disposal operations.

But selection of the fastest and most efficient machine tools for a modern engine plant such as this is only a part of the job. In back of every machining operation is an untold amount of metallurgical research on countless engine components; behind every handling operation is a study for a better way to do it.

What's The Long-Term Outlook For Machine Tools?

• Rapid technological changes and a growing population, basic factors in the expanding U. S. economy, will continue to be the main forces behind an increasing demand for machine tools, presses and other capital goods equipment.

Two fast-spreading industry trends will add further impetus to the market . . . These are the growth of long-range planning and the expansion of consumer markets through product innovations . . . Together they add up to a healthy future for the machine tool market.

> By SUMNER H. SLICHTER Lamont University Professor, Harvard University Cambridge, Mass.

◆ THE ROLE OF CAPITAL GOODS in an expanding economy may be looked at from two points of view: (1) The effect of investment in capital goods upon the productive capacity of the economy; and (2) the effect upon the demand for goods in general.

Investment in capital goods—in machine tools, rolling mills, presses, etc.—affects productive capacity in two ways. In the first place as the labor force grows, more investment in plant and equipment is needed to prevent a drop in the amount of plant and equipment per worker.

The recent upsurge of population in the United States has not yet had time to affect the size of the labor force. Within 10 years, however, the high birth rate of the '40's will be reflected in more job seekers, and a step up of

investment in plant and equipment will be needed to keep pace with the labor force.

In the second place, investment in capital goods is also necessary to raise the productivity of labor. Between 1900 and 1948 industrial plant and equipment per worker (expressed at cost less depreciation in dollars of constant purchasing power) increased about 32 pct. But while the amount of plant and equipment per worker has much effect on individual output, it has less effect than the kind of plant and equipment provided for the worker.

Professor Slichter, well-known economist and business consultant, is a frequent contributor to the New York Times Magazine and the author of more than half a dozen books on business and economics. Between 1900 and 1948, when plant and equipment per worker was increasing 32 pct, the use of energy per worker increased 325 pct. Output per manhour (expressed in dollars of constant purchasing power) rose 139 pct, or more than four times the growth in plant and equipment per worker. It is obvious that changes in technology had much more to do with the rise in productivity than the mere increase in capital per worker.

How Investment Affects Demand

How does investment in plant and equipment affect the demand for capital goods and eventually consumer goods? This is a subject of great importance that is not well understood. A stable rate of investment in capital goods (even a high rate) does not raise the demand for these goods; it simply helps prevent demand from dropping. Thus, if \$20 billion is invested in

plant and equipment year after year, the total demand for capital and consumer goods (other things being equal) is not increased; it is simply kept where it was to begin with.

For investment in plant and equipment to increase the demand for goods in general, the rate of investment must rise. Suppose, for example, that investment in plant and equipment rises from \$20 billion a year to \$22 billion. Capital goods production immediately increases by \$2 billion to meet the demand. But the ultimate gain in consumer good demand is considerably more than the \$2 billion increase in sales of capital goods.

Larger payrolls and profits in capital goods industries result in a higher demand for consumer goods. This in turn raises profits and payrolls and further adds to consumer demand. This goes on indefinitely at a diminishing rate unless interrupted by changes in conditions.

What
Advancing
Technology
Means to
Productivity



From 1900 to 1948

Capital per worker increased 32 pct

While-

increased 139 pct

[&]quot;Although the amount of plant and equipment per worker has much effect on individual output, it has less effect than the kind of plant and equipment provided for the worker."

A drop in the rate of investment in plant and equipment also has far-reaching effects. If the rate of investment drops from \$20 billion to \$18 billion a year, there is an immediate drop of \$2 billion in the demand for capital goods. This drop in payrolls and profits of the capital goods industries reduces demand for consumer goods and hence the payrolls and profits in the consumer goods industries. Each new drop in payrolls and profits further reduces the demand for consumer goods so that the total drop in demand is somewhat larger than the original \$2 billion decrease.

Fortunately, people are much more ready to increase their consumer goods purchases when their incomes go up than they are willing to cut their spending when their incomes go down. This characteristic behavior of consumers helps the economy to grow because the total increase in demand generated by a given increase in investment is greater than the total decrease in demand that would be generated by a drop in investment of the same amount.

The fact that the capacity of the economy to produce goods depends upon the rate of investment in plant and equipment, and that the capacity of the economy to demand goods depends (among other things) upon the rate of increase of investment in plant and equipment, makes some economists fear that our capacity to produce goods is bound to outrun our capacity to raise the demand for goods.

Just how good or bad are the prospects that the demand for goods will grow at about the same rate as the expanding capacity of industry to produce goods? Economists who believe productive capacity will outrun the demand for goods support their case by referring to the decreasing rate of increase in industrial plant and equipment.

Between 1850 and 1880, industrial plant and equipment per worker (expressed at cost less depreciation in dollars of constant purchasing power) increased 97 pct; from 1880 to 1900 by 60 pct; and in the period 1900 to 1948 by 32 pct. The economic pessimists believe that the rate of increase in investment will continue to drop because they assert that investment in the future will receive less stimulus from the discovery and development of new natural resources and from the growth in the labor force.

Only the future can determine whether the pessimists or the optimists are right. Thus far the pessimists have been wrong, and in my judgment, the future is not likely to confirm their present fears.

My reasons for this belief are three: (1) Increases in investment are not the sole source of growth in the demand for goods; (2) increases in investment in plant and equipment are not the sole source of growth in investment; (3) the decreased rate of growth in plant and equipment expenditures has apparently ended.

Growing Research Will Create More Demand



Engineers and scientists in the U.S.



"We have more than twice as many men trying to introduce obsolescence into our stocks of goods and methods than we had 15 years ago . . . "

Why the Market Will Keep Pace

1. Increases in investment are not the sole source of growth in the demand for goods.

A powerful source of growing demand lies in the efforts of people to live better by spending a higher proportion of their incomes on consumption. The very fact that the long-run ratio of consumption expenditures to incomes has remained about the same while the purchasing power of per capita incomes has enormously increased, shows a disposition to spend a larger part of incomes on consumer goods.

Evidence that people are trying to raise their consumption relative to their incomes is also produced by periods of recession, such as the recession of 1953-54. In such periods when rising investment is not increasing incomes, consumption may rise faster than incomes. At the bottom of the recession in the third quarter of 1954, consumption was at the annual rate of \$4 billion more than at the peak of the boom in the second quarter of 1953. But personal incomes

"The scale of technological research is limited by the number of technical personnel . . ."

after taxes were only \$2.8 billion a year greater. The rise in the disposition to consume was one of the principal causes for the rise in personal incomes.

2. Increased investment in plant and equipment is not the sole source of growth in investment.

Investment in inventories is likely to grow in the long-run at about the same rate as the total output of the economy, no more and no less. Investment in housing, a large category of investment, may well grow faster in relation to the increase in the number of families than it has grown in the past. Only a bare beginning has been made in improving housing and household appliances and thus in making old houses and appliances obsolete.

3. The decrease in the rate of growth in expenditures on plant and equipment that continued until about 1948 has apparently come to an end.

An extraordinarily rapid increase in expenditures on plant and equipment has taken place since 1948. In the 6-year period 1949 to 1954 inclusive, the net investment in plant and equipment per worker in dollars of constant purchasing power has risen almost 30 pct. This is more than five times the annual rate of increase between 1900 and 1929, about twice the annual rate of increase between 1880 and 1900, and almost three times the annual rate of increase from 1850 to 1880.

The enormous increase in expenditures on plant and equipment since 1948 partly reflects needs that accumulated during the depression and World War II and partly the stimulus given to some types of industrial construction during the Korean War. But outlays on plant and equipment held up extraordinarily well even during the recession of 1953-54. It is reasonable to suppose that these outlays reflect in considerable measure the enormous increase in technological research that has taken place in the United States during the last 30 years.

At present the United States has about 200,-000 research engineers and scientists trying to introduce changes in products and technology. As late as 1941, the number was only 87,000. Since we have more than twice as many men trying to introduce obsolescence into our stocks of goods and our methods as we had 15 years ago, we must expect a strong demand for new equipment and plants.

Possibly investment has received less stimulus than formerly from the discovery of natural resources or from the growth of population, but this drop in stimulus has been more than offset by the growing stimulus from technological research.

At present, the scale of technological research is limited by the numbers of technical and scientific personnel. But managements are more and more discovering the potentialities of technological research. Hence, there will be strong inducements for young men and women to become scientists and engineers. This means that the United States will increase the number of scientists and engineers needed to keep outlays on plant and equipment growing steadily.

Industry Trends Brighten Equipment Outlook

Two rapidly growing trends in private industry are increasing the demand for plant and equipment. One trend is the growth of planning for long-term expansion; the other is the pursuit of profits through innovation.

The idea that managements should plan for the long-range growth of their enterprises is not new. But only in recent years has long-range planning become a more or less definite staff function. Formerly, long-range planning was an incidental activity of busy line executives. The fact that it was often done with great shrewdness and even brilliance does not alter the fact that long-range plans were usually made spasmodically, without careful market analysis, and without systematic review and reconsideration of plans. In many firms there was no long-range planning whatever.

The growing acceptance of the idea that every management should have carefully studied and frequently reconsidered plans for long-term development, and that a staff should be provided to help line management make the needed plans, means that changes in products, equipment and methods will henceforth be made to a greater extent in anticipation of changing conditions.

The sensational growth in industrial research mean that management has discovered the enormous returns to be made from successful innovation. A market as large as the United States, which comprises 40 pct of the purchasing power of the world, is an innovator's paradise.

The huge size of this market reduces the risks of innovation because the larger the market the better the chance that enough prospective buyers will like the innovation enough to make it pay. In addition, the larger the market the greater are the rewards from the successful innovation.

As population grows and as real per capita incomes rise, the market will become more and more favorable for innovators. American business men are only beginning to grasp the potentialities of technological discovery as a device for making obsolete the goods and equipment now owned by consumers and industries.

204

THE IRON AGE





How To Build A Sound Equipment Policy

By G. J. MATCHETT, Director National Center of Education and Research in Dynamic Equipment Policy Illinois Institute of Technology, Chicago

- Machine tools don't have to be old to be old fashioned . . . It's their economic usefulness that counts these days; not their age or appearance . . . So it's often good business to retire them while they're still young and handsome.
- Here's a down-to-earth guide to the Why, When and How of equipment replacement analysis . . . It shows the need for understanding, good timing, a practical formula and common sense in building a sound replacement policy.

♦ MACHINES, like men, are mortal. They wear out. A few of them are like the Deacon's wonderful one-horse shay, which continued to operate at peak efficiency until one day it disintegrated entirely. Typically, however, the aging of a facility is accompanied by a steady deterioration in performance. Because there is no such thing as "durable" goods, except in a very relative sense, any firm must have some sort of an equipment policy, some arrangement for retiring machines that have outlived their usefulness.

But machines do more than become old; they become old fashioned. Ours is a dynamic economy with a highly developed and ever advancing technology. When a machine is taken out of service, frequently its place is taken not by an exact replica but by improved equipment. A milling machine today, for example, has higher speeds and better control devices than did its predecessor of a decade ago. The term replacement as it is used in modern industry must be understood to mean replacement with the best machine available.

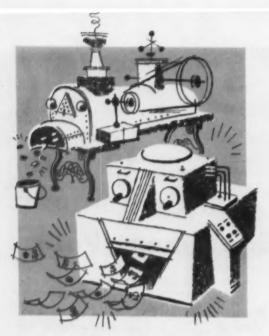
The fact of obsolescence in a dynamic economy explains why an alert equipment policy may spell for a firm the difference between success and a gradual weakening of its competitive position that may end in a failure. The results of physical deterioration and age are there to see.

Not so with obsolescence, which often creeps in like a thief in the night stealing profits from the business. In fact, the first evidence of obsolescence may be a diminution of profits as a firm finds it increasingly difficult to sell its product because it can not meet the price or the quality of the product of its competitors.

What is a sound equipment policy? Like any other aspect of business management, the replacement policy of a firm is sound or not depending on whether it places the firm in the best possible profit position. In other words, it is simply good business.

An overall program of tardy replacement leads ultimately to an obsolete and run down plant, with excessive operating costs and inferior output. Excessively rapid replacement, on the other hand, strains unduly the capital resources of a firm and fails to realize the maximum return on the investment.

Less conspicuous in its adverse consequences but probably far more general, however, is the situation in which a poorly planned or executed equipment system leads to replacement of some equipment too fast and other equipment too slowly. And unfortunately, here is a case where opposite errors do not cancel; instead they pile up to produce extra and unnecessary costs coupled with inefficient use of available capital.



"it is the economic usefulness of a machine . . ."

Costs to Consider

The underlying cost principle that applies to replacement problems is easily stated. The inferiority of the present facility to the best available replacement—an inferiority which stems from physical deterioration, obsolescence, or both—must be translated into costs. These costs are then compared with the capital outlay called for by replacement.

A prerequisite to a sound equipment policy is the mastery of a few simple do's and don't's of cost analysis.

In comparing two equipment alternatives—the old and the new—it is necessary, first of all, to use some discretion in choosing which costs to incorporate in the study. Against the machine now in use do consider such items as operating cost (including extra labor costs), repair and maintenance, cost of downtime if actual loss is involved, salvage value or the price the old equipment would yield if sold, costs related to inferiority of the output in quantity or quality, and the cost of rebuilding or reconditioning if such steps are contemplated.

Do not consider the original cost of the old equipment, any money that has already been spent in maintaining it, or the value at which the old equipment is carried on the books.

A simple rule that is accurate and often helpful is the following: The only costs pertinent in an equipment study are those that would actually be changed by a decision to replace or not to replace. Any costs that have already been incurred will not be changed by a decision to replace and, therefore, should not be considered. The past, like water over the dam, cannot be recalled. Similarly, book value is an accounting concept deriving from a rate that was determined when the machine was purchased. It in no way re-

flects the real value of the equipment at the present time. The appropriate cost to consider here is the cost of what the firm gives up if it does not dispose of the machine—its present market or salvage value.

Applying the rule to new equipment, do consider its initial cost installed and ready to operate, an interest charge on the money invested, its anticipated salvage value at the end of its expected life, any income advantage due to increased capacity or superiority of product, any operating superiority such as a saving in labor, and any difference in the tax status of the firm.

An important non-cost estimate that must be made for new equipment is its primary service life. This is the life during which the equipment is actually expected to serve for the major purpose for which it is acquired. Final use in a stand-by capacity should not be included in the life estimate.

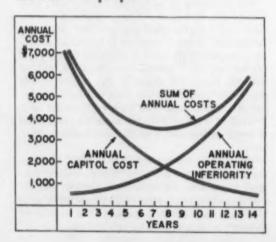
Do not consider savings unless they are clearly realizable. Do not apply an arbitrary burden or overhead charge against the new equipment. If changes are expected in indirect or burden costs as a result of the purchase of new equipment, these should be itemized separately. Otherwise, there is a danger of overstating costs.

In all equipment problems, the costs properly associated with new equipment may be divided into two major categories.

The first type may be termed operating inferiority. A piece of new equipment can be expected to deteriorate physically as it ages, with an accompanying increase in the annual costs of operation and maintenance. It can also be expected to grow increasingly obsolete. Thus, the operating inferiority that a machine accumulates over its life will tend to increase from year to year.

A second major type of cost is the provision that must be made for the recovery of invested capital with interest. The capital outlay required

Cost Behavior of New Equipment



"DO's" and "DON'TS"

For Equipment in Use

Do Consider:

- 1. Operating Cost
- 2. Repair and Maintenance Cost
- 3. Downtime Cost
- 4. Salvage Value
- 5. Costs involved in Producing Fewer, or Inferior Parts
- 6. Rebuilding or Reconditioning Costs

Don't Consider:

- 1. Original Cost of Equipment
- 2. Money Already Spent on Repair or Maintenance
- 3. An Unrealistic Book Value

For Replacement Analysis

For New Equipment

Do Consider:

- 1. Initial Cost
- 2. An interest Charge on Money Invested
- 3. Salvage Value at End of Useful Life
- 4. Cost Advantages of Improved Output
- 5. Labor Savings
- 6. Primary Service Life
- 7. Any Effect of a Change in the Firm's Tax Status

Don't Consider:

- 1. Any Savings Not Clearly Recognizable
- 2. Applying Any Arbitrary Burden or Overhead Charges

for the acquisition of the equipment must be translated into an annual charge. The longer the expected life of the new equipment, the less is the annual charge of capital recovery.

One step in a sound technique of equipment analysis is to find the total of these two costs on an average annual basis so that this total may be compared with the yearly cost of keeping the old machine.

These two types of cost are related in opposite ways to the expected life of the new equipment. A short expected life means low average annual operating inferiority but high annual costs of capital recovery. A long expected life implies high average annual charges for operating inferiority and low ones for capital recovery. This pattern prevails regardless of the type of equipment. This is why standard equipment and replacement formulas may be successfully applied as tools in a sound equipment policy program.

The behavior of operating inferiority and capital costs of new equipment may be illustrated by the very simple graph on p. ...

The upper curve represents the sum of the annual operating inferiority and the annual capital cost. The lowest point on this curve indicates the most favorable annual cost for the proposed equipment. This is the cost that is compared with the cost of continuing the present equipment in operation for another year. If the latter cost is higher, replacement is signalled.

Replacement Techniques

A replacement policy may be based solely on hunches and guess work, and a sizeable number of firms pursue just such a program. Much in vogue also are a variety of replacement formulas of varying degrees of complexity. Now whenever each of several quite dissimilar methods of attacking a problem finds some degree of acceptance, it is reasonable to assume that no one of them is free from defects.

Some techniques of replacement analysis commonly used amount to no more than crude rules of thumb—they are too simple, unfortunately, to do justice to the various considerations that should be included.

Other more sophisticated techniques are also more complicated, and may present difficulty when used by people who do not understand their implications or when presented to members of top management unfamiliar with their terminology and methods.

An example of an oversimplified approach to replacement policy is to be found in the short payoff requirement. Sometimes a short payoff requirement of two or three years is combined with the stipulation that only direct labor savings should be considered.

One difficulty of this approach is that it fails to consider what happens at the end of the payoff period. It is quite possible that equipment that pays out fast may not be as economical as other equipment which proves to be better over the long haul. After all, a long life expectancy is certainly a point in favor of a machine, and the short payoff requirement rules out any consideration of this advantage.

Another difficulty is that this method allows replacement only where it would lead to very large returns. Some profitable equipment alternatives may thus be disregarded altogether because still greater profits cannot be demonstrated. Any payoff requirement can eventually be met as a plant becomes more run down and inefficient,

Timing Is Important

Judging "when" to replace machine tools is basic, too. Here are three faults to avoid in overall replacement programs.

- I. Tardy Replacement: A bad habit that could lead to an obsolete, rundown plant with high costs and inferior output.
- 2. Too Rapid Replacement: Puts undue strain on capital resources and fails to realize maximum return on investment.
- 3. Some Fast Replacement, and Some Slow:
 Sounds like the "happy medium" approach, but opposite errors do not cancel each other.

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A Make or Buy Case Study

THIS CASE, adapted from an actual study made at the Barber-Colman Co., is interesting because, as is frequently true, the problem is not one of pure replacement. The alternatives are for the company to equip itself for making corrugated containers or to continue to purchase them.

The initiative for this particular study came from the supervisor in charge of stock rooms and packaging and the Assistant Works Manager as a result of their efforts to devise means for reducing packaging costs.

Their survey disclosed that a great many electronic items were packed in wooden boxes and crates, custom made in the carpenter shop. The only reason that many of these items were not packed in less expensive corrugated containers was that the number of each size of container used was so small as to make their purchase not feasible. If the company were to acquire container making equipment, it appeared likely that the use of wooden boxes could be largely eliminated with a substantial saving since small lots of fibre containers could easily be made on modern box-making equipment.

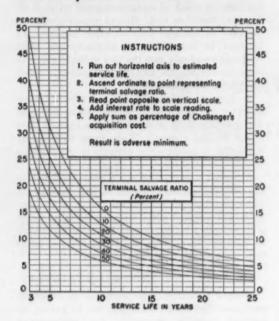
An equipment analyst was assigned to the case to compere the present method with the proposal of box-making equipment—the defender with the challenger on the Barber-Colman enalysis form (see above). To compute the cost of the new equipment, the ratio of the estimated salvage value to the installed cost was determined—10 pct. From this ratio and the estimated primary service life, of 15 years, the MAPI chart value on p. 209 is 8.5 pct. Adding this chart value to the interest charge of 14 pct and multiplying the sum by the cost and operating inferiority turns out to be \$5,895. In terms of the graphic picture presented on p. 206, this figure is reached at the point where the upper curve is the lowest. Thus the MAPI formula provides the technique for computing this minimum value directly in a simple operation using the chart value and the rate of return.

This figure is then compared with the difference between the operating inferiorities of the present and proposed methods.

The most difficult part of this case analysis, and any other analysis as a matter of fact, lies in the preparation of the cost estimates. The analysis sheet shown here was accompanied by four pages of single spaced material explaining and justifying the estimates that are summarized on the analysis form.

This case illustrates one of the virtues of the MAPI replacement system—its emphasis on the variety of costs and savings about which estimates must be made for a thorough equipment study. The more important types of costs are specified on the Barber-Colman form.

MAPI Replacement Chart



but it would be most unwise to defer replacement until such a time.

The same considerations hold for stringent rate of return requirements that may run to 30 or 40 pct or even higher.

One of the more complete standard approaches to equipment problems is the Uniform Annual Cost method. In accordance with this procedure, time adjusted annual costs of the new equipment and the old are computed and compared.

A well-known formula based on the uniform annual cost approach is the MAPI Replacement Formula developed by the Machinery and Allied Products Institute and its Research Director, George Terborgh. Of the several well developed formulas, this is the one most common in the machine tool industry.

The MAPI Formula differs in two ways from the standard annual cost method. First, it is the only formula that allows explicitly for the important fact of obsolescence. Secondly, instead of including total costs, the MAPI approach involves the use of cost differences or cost differentials between the old and the new equipment. In the presentation of the formula, there has been developed an excellent check list of costs that should be considered in making equipment decisions.

The chief criticisms of the MAPI Formula center around objections to the technical terminology that was developed for its exposition. At the present time a committee is engaged in reviewing the MAPI approach with the goal of simplifying its terminology and perhaps considering other modifications.

Setting Up o Program

Once a firm has decided to introduce a scientific equipment procedure, the most important task is the provision for making cost and income estimates. These estimates form the heart of the analysis regardless of the particular formula or technique used.

The responsibility for making equipment analyses may be located almost anywhere in the organizational set up. Regardless of where the responsibility for the formal analysis falls, a successful equipment program will involve the active participation of individuals in most of the major divisions of a firm.

The various departments concerned directly with production can provide records of machine performance and operating costs, records regarding maintenance, repair, and downtime, estimates on overhauls and periodic capital additions, installation cost estimates and power requirements, item by item estimates of indirect costs, machine standard times and setup times, machine quality performance records, and scrap and rework costs. Men who work with machines can help with the very important estimate of the primary service life of the proposed equipment.

The purchasing department can supply estimates of the salvage value of old equipment and can obtain equipment price quotations, delivery costs, and terminal salvage value estimates on the new equipment.

The departments dealing with accounting records and cost control can provide historical cost data that may be useful in projecting machine cost estimates into the future. They can also provide information on the cost of floor space, taxes, insurance, power, and fringe labor benefits. These departments may also make valuable



"do not consider . . . money spent maintaining it."



". . . the need for reason and horse sense . . ."

audits of equipment analyses and check results to see if anticipated savings are being realized.

The sales department may be called upon to provide forecasts of sales where capacity is involved. Where the quality of the product will be improved with the use of new equipment, the sales department may evaluate the income advantage of this product superiority.

The finance department may give information regarding the availability of capital for the purchase of equipment, determine the appropriate interest rate to be used in analyses, and rank the opportunities for investment.

In order to emphasize the pervasiveness of a scientific equipment program, Don Stewart, president of Barber-Colman, stated before a class in equipment policy at Illinois Tech that the equipment analyst should not only have had training in economics and engineering but should also be a diplomat.

What to Analyze

The Barber-Colman Co. has made about 900 equipment analyses since 1950, averaging roughly 5 to 6 studies per month per analyst. The company has about 2000 machine tools in its Rockford plants. It is obvious that a firm cannot run an analysis on all of its equipment alternatives every year. How shall it go about selecting those studies that will be most worth while? Here again a few simple check points have proved useful to many companies:

1. Technological developments. There is no substitute for alertness. Some communication techniques should be established within the firm so that appropriate equipment studies may be initiated as the result of the information gained about new equipment design and new processes.

2. Operating costs. When a firm introduces a systematic replacement program, it usually es-

tablishes a more or less comprehensive system for keeping track of equipment costs on each individual machine tool. Rising repair costs, an increase in spoilage and defective material, an increase in downtime, the necessity for more frequent overhauls and the like indicate that the machine has become less efficient and is a likely candidate for replacement.

3. Age of equipment. Age, of course, is no criterion of obsolescence. Nevertheless, the older the equipment the greater are the chances that it has become obsolete. Some firms have found it feasible to assign some priority to the analysis of its older machine.

Although a particular study may be called to the attention of the analyst, it may be that an elaborate study is not necessary. It often happens that a rough check using major cost items will indicate whether the study seems promising or whether the savings will be, at best, so small that replacement can be ruled out.

Growing Interest

Modern executives are becoming increasingly conscious that solid advantages can be gained by making suitable provision for replacement analysis in their organizations. Objective and scientific equipment analysis is coming into its own as an indispensable tool in decision making. This is not to say that the need for reason and horse sense have been eliminated. Judgment must be exercised at all stages of an equipment study—at the bottom when the necessary estimates are being prepared, and at the top in the final evaluation of the results. Indeed, proper analysis points up the implications of informed estimates and business experience.



"equipment analyst . . . should be a diplomat."

Choosing Machine Tools for Medium-Run Production

- General purpose machine tools are still the mainstays of medium production shops... But they're getting fancier all the time... Making the wisest choice from among many new models is easier if you remember that "time is money."
- Look for a machine powered to do the fastest possible cutting job with minimum vibration . . . Next, consider the machine's time saving potential for tooling setups and changes . . . Work handling and maintenance can save time and money, too.

By DR. W. W. GILBERT, Machinability Consultant General Electric Co., Schenectady, N. Y.

♦ MACHINE TOOLS intended for use in the "medium-run" production range pose a difficult problem for buyers—and for builders as well. Such machines cannot take full advantage of the techniques applied to mass production metalworking equipment, nor can they be as modestly simple as many manually operated types which are used for tool room work, or relatively short runs.

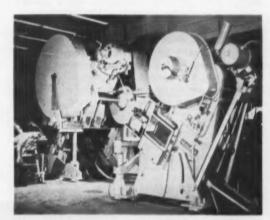
If medium-run production is conceded to mean fairly frequent workpiece changes, then these changes must, for the most part, be accommodated on adequate general purpose tools. Since competition usually makes the element of time an important factor, the setups for each job change must be made quickly; part handling must be efficient; and actual machining rates must be as fast as possible.

Also, since the necessary setups, handling and machining require capable workers and operators, medium-production equipment should not impose too severe a physical strain on personnel.

Thus the builder must make, and the buyer must wisely choose, modern machine tools that are fast, versatile, and relatively inexpensive.

Wisdom in purchasing a general purpose machine tool to cover a wide range of medium-run jobs is simply a reflection of the buyer's judgment in regard to machine-operating costs. Basically, machine-operating costs can be grouped in three areas: (1) actual cutting costs; (2) tool setup and tool change costs; (3) non-productive costs.

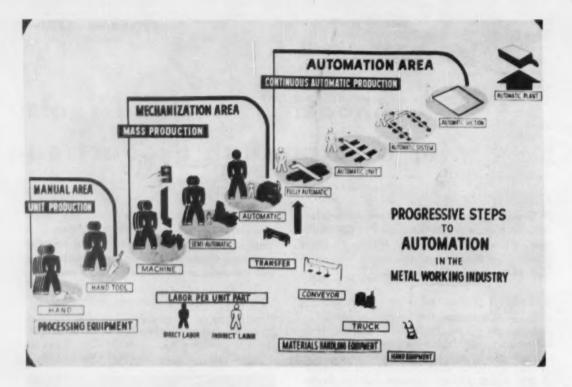
Let us assume that the machining department of a large plant needs a new general purpose machine tool to handle a variety of medium-run



VIBRATION at high speeds should be controlled. These presses stand on vibration dampeners.

jobs that will be coming up soon. Earnest consideration is given to several basic tool types, and the various models and sizes of each. Most show equal promise of doing the work accurately and well. But, inevitably, the choice must be narrowed down to one particular model of one basic type machine.

This process of elimination requires that the proposed individual machine tool models must be appraised within each of the aforementioned machine-operating cost areas. The one eventually chosen will show the best overall cost-cutting potential for actual machining and tool changing, as well as for the numerous non-productive factors to be encountered.



AUTOMATION is simply another phase in the step-by-step process of upgrading manufacturing operations as shown in the above chart. The first step, long since passed by many industrial firms, is the manual area of manufacturing where many people combine to produce one finished unit at a time. Originally the work was done by hand; later hand tools and simple material handling equipment were brought into the picture.

The next step in the upgrading process results from the use of power-driven tools and simple conveyors. In this area, the addition of automatic controls for individual

machines helps workers to achieve greater output with less effort but more accuracy. In this area also, the required amount of supporting labor is greater, principally because more maintenance is needed on the more complex equipment.

Third step on the cycle chart shows the automation area, where fully automatic machines are equipped with transfer devices to move the parts from one machine to the next. Thus these machines and transfer devices may be combined into automatic units, then into an automatic system and finally into an automatic section.

In the first area, the costs involved in actual metal cutting may be reduced by equipment that can take full advantage of modern research in machinability and cutting tool materials. Cutting rates can frequently be increased significantly by using: (1) higher speeds and feeds; (2) multiple tools of the best design; (3) freecutting materials.

Most modern machine tools have sufficient power for average commercial conditions, but some of the equipment models are not rigid enough to take heavy cuts at high speeds without developing excessive vibration. Reducing the vibration factor will allow more effective and more economical use of the harder grades of carbide.

There is a need for heavy sub-bases to be added to standard machine tools if vibration

mountings are to be used and alignment maintained. Machine tool frames should be designed so that they can be fastened to these floating bases and still provide ample allowance for leveling. The punch presses shown in an accompanying illustration are mounted on vibration dampeners that minimize shock transfer to other equipment.

Prelocated tools bring savings

In the area of tool-changing costs, the use of prelocated tools and quick-change toolholders can often mean worthwhile savings. These modern developments make it feasible to operate equipment at higher cutting speeds even though tools may have to be changed more frequently.

Prelocated tools are especially important on fast cycling machines where the dulling or break-

THE THE COST HE CTION SHALL

- I. ACTUAL CUTTING COSTS
- 2. TOOL CHANGING COSTS
- 3. IDLE COSTS

TO REPORT ACTIVAL DATE OF THEIR

- A-TAKE HEAVIER CUTS
- B-USE MULTIPLE TOOLS
- C-USE MULTIPLE UNITS
- D-INCREASE CUTTING SPEED
- E-USE OPTIMUM TOOL LIFE

I II START SALES OF CHILD

- A-ADOPT STANDARD TOOLS
- B-LIMIT TOOL WEAR
- a) USE HARDER GRADES
- C-STANDARDIZE & SIMPLIFY GRINDING
- D-REDUCE TOOL SETTING TIME
 - a) INSERT TOOLS
 - b) PRE-SET TOOLS

LOOK FOR BETTER

- A-TOOL ACCESSIBILITY
- B-MACHINE SET-UP FEATURES
- C-TOOL ADJUSTMENT
 - a) TRACER
- b) WEAR COMPENSATOR
- D-GAGING
- E-WORK HANDLING & CLAMPING

ing of a single tool will prudently shut down the entire operation until a replacement is made. Insert, or "throw-away" types of cutting tools, such as the typical square, triangular or round carbide shapes, allow rapid changing combined with prelocation. With these modern aids it is not necessary to change the tool holder. When a cutting edge becomes dull, a fresh edge is simply indexed into position.

The subject of tool changing is a major problem that deserves much additional study and attention from builders and machine tool buyers. It is not practical to develop high production equipment with impressive theoretical 100 pct efficiency rates if it is also necessary for the operator to change tools constantly. The theoretical maximum output figure becomes meaningless when the actual efficiency rate is battered down by repeated stops to install fresh cutting tools.

Generally speaking, aside from actual tool changing, the buyer should prefer a standard machine tool design that makes the best provision for (1) bringing cutting tools quickly into machining position, and (2) making the tools accessible for speedy adjustment or replacement.

The typical turret lathe design admirably demonstrates both of these advantages. Main and cross slide turrets are generally handy for any quick attention that may be required, and they hold tools rigidly for accurate, fast positioning during a sequence of machining operations. But power indexing of turrets is needeed on some of the larger machine tools to reduce operator latigue.

Standardization can help

In the same overall tooling area, it follows that standardized spindle mountings should be used wherever possible. This would permit using interchangeable arbors, chucks and tool holders on a variety of similar machines.

As for the non-productive area in overall machining costs, workpiece handling becomes more of a problem as the size and volume of the parts increases. To help the machine operator to lift and clamp his work more easily, the buyer of general-purpose tools for medium production should consider the benefits of power-operated lifting and positioning devices.

It is becoming more desirable for the machine tool builder to supply versatile handling devices as standard equipment These mechanical aids should, if possible, accommodate a variety of workpiece shapes and sizes, but still be rigid enough to take full advantage of the machine's capabilities.

Also, in medium production operations it is not always economically feasible to build jigs and fixtures that will quickly and accurately locate and hold the parts to be machined. For this reason, the machine tool buyer should seek equipment that is designed and built to include both a loading area and a machining area.

For example, there are twin-table milling machines that allow the operator to set up a work-piece on one table while cutting takes place at the other. This is a simple feature that can increase machine output significantly.

Machine tool service and maintenance is another inescapable factor in the non-productive cost area of medium-run operations. For the buyer's protection against excessive down-time for service and repair, equipment quality is important. National Machine Tool Builders Assn. and J.I.C. standards, if adhered to by the builder, can be excellent initial insurance. Electrical, hydraulic and pneumatic control systems, manufactured to these standards, should be much more trouble-free than non-standard devices.

Of course routine service and maintenance ac-

Where the builder must supply repair and maintenance skills, his ability to do so with promptness can be more important than many other factors in machine tool purchases . . .

cording to the builder's recommendations is the best continued assurance against excessive downtime. But unexpected difficulties are apt to crop up at anytime; usually in some extremely complicated control mechanism.

When this non-routine trouble occurs, the machine tool user must either have his own well trained service technicians, or he must rely upon the builder's service staff. If the user has enough complicated equipment to warrant employing one or more repair specialists, there is no problem. But where the builder must supply such skills, his ability to do so with promptness and efficiency can be a far more important consideration than many other factors involved in machine tool purchases.

Then there are modern machine tool accessories, increasingly available either as standard or optional equipment. They may well be investigated by the buyer of general purpose tools for medium-run production. Among these accessories are variable speed motors which can be used for the main drive, for feed motors, and for other variable speed operations.

Vary speed while cutting

With these new developments, the machine tool operator can quickly vary speed rates while machining is in progress. Thus optimum speed conditions may be applied to each cut to reduce overall machining time.

Another increasingly useful group of general purpose machine tool accessories are the automatic tracer controls. These units can be supplied to trace model parts or templates in one, two, or three dimensions, and will guide the cutting tool with a high degree of accuracy. Once made, the templates or models can be stored away after use, and can be set up quickly whenever repeat production runs are required.

The much-publicized record playback control systems may also become increasingly important to medium-run machining operations. One form of this control device is shown in an accompanying sketch. It records all machine tool motions on a magnetic tape as an operator manually controls the machining of the first workpiece in a production run.

Subsequent parts are made as exact duplicates of the manually produced original, simply by playing the tape back to control the machine functions. In this case also, the tape can be safely stored away and recalled for almost instant use whenever the part run is reordered.

Somewhat similar to the tape-record control system are punch card processing units which

completely control a machine tool or press operation. Other devices use digital computers in combination with punched tape instructions and automatic feed-back error compensators to guide cutting tools accurately. All such automatic machine controls are readily adaptable to mediumrun production.

Don't forget chip disposal

In thinking about some of the more spectacular accessories, the general purpose machine tool buyer should not lose sight of such things as the means provided for chip disposal. A minimum of difficulty in disposing of chips can add significantly to a machine tool's productive capacity. It is preferable to have chips fall free of the machine elements (especially the tooling area) and into a suitable conveyor or chip box.

In the future, when general purpose machine tools are to be purchased, certain considerations beyond those already mentioned will probably have to be taken into account. For medium-run production of an end item most generally involves such things as part storage, handling, assembly, inspection and testing—all in addition to actual machining or part fabrication.

Thus to increase overall manufacturing efficiency, all operations in the production cycle will probably be surveyed along with machine tool needs. And a coordinated effort will be made to improve the entire production setup as a whole.

Apply automation concept

This view of product manufacturing as a unified process (rather than a series of disconnected operations) is the first practical look at the automation concept for many a medium-volume manufacturer. And it is not illogical or useless to consider ways and means of applying the concept to medium-run production.

It is often possible to apply the automation concept to operations in the medium production range. Machining processes are already being integrated with part inspection, and even some small assembly work. Eventually, product testing and packaging will be tied in with these operations.

Long range forecasts indicate that business volume will double in the next 10 years. At the same time, available skilled help is predicted to increase less than 13 pct. These factors, plus increasing competition from domestic as well as foreign sources, all point toward the fact that doubled demand must be met not only by building bigger plants, but also by new and more efficient manufacturing methods.

Survey Shows Machine Tool Buyers Raising Their Sights

- ◆ Increasing business activity through 1955 and a solid outlook for 1956 have caused machine tool users to revise upward their original purchasing estimates . . . Surveys taken both in February and June of this year show an increase of 8 pct over original plans.
- The report was compiled from replies of 1207 representative machine tool users who bought \$289 million worth of machine tools in 1954 . . . The survey also shows what users think about replacement stimulants, show locations, show intervals and performance checks.

By OLIVER JOHNSON
Director of Research, THE IRON AGE

◆ THIS YEAR'S Machine Tool Show will find visiting viewers of the latest industry developments in a buying mood.

The economic upsurge that has characterized 1955 business and the solid outlook for 1956 have prompted users to revise upwards their original estimates for ordering machine tools.

This is the most significant conclusion of an Iron Age Market Research Div. report on attitudes and thinking about the Machine Tool Show of the men who will do the buying.

This and other conclusions should be a valuable indicator for machine tool builders in what to expect in direct results from this year's show, the first since 1947. It can be an important guide on forward planning regarding future shows.

The report was compiled from a broad survey resulting in replies from 1207 representative machine tool users who bought \$288,720,000 worth of machine tools in 1954.

In addition to predicting heavier machine tool purchases, the survey shows:

- The Machine Tool Show will not affect customary patterns of seasonal buying.
- Most users believe the show should be held at 2-year intervals, but larger buyers tend to favor longer periods between shows.

- Autumn is favored as the time most convenient for show dates.
- · Chicago is far and away the preferred site.
- General purpose tools are of primary interest.
- Accelerated depreciation write-offs would do most to stimulate replacement of old machine tools.
- Nearly every tool user employs checks of performance against anticipated results.

Increased machine tool buying intentions are disclosed through a supplementary questionnaire mailed in June, 1955, which revealed that the 1207 respondents of the original survey, conducted in February, had expanded their tool buying programs to keep pace with the continued high flow of business.

In February, planned purchases for 1955 were 7.5 pct less than 1954. Deducting reports from motor vehicle and parts plants, which were thrown out of perspective by major tooling in 1954, conclusion was that other machine tool users would buy 2.5 pct more than the previous year.

But noticing that the business recovery had progressed beyond expectations, the supplementary survey was dispatched to determine if, and to what extent, a change of plans had occurred. Results showed an 8 pct upward revision.

While the survey could not forecast any further change in plans, it is logical that with increased business activity and the favorable outlook for a lengthy period ahead, this figure will be conservative at show time.

The initial question asked if the show would result in a change in the users' customary buying pattern. A 77.9 pct majority reply it will not, while 11.8 pct say it will delay some purchases until the show. Only 10.3 pct report they are not purchasing this year.

Some poor two-year interval

Many reporting that their 1955 plans will be unchanged do say that 1956 plans will be affected. Of those 143 plants that will delay some purchases until show time, 54 of them bought more than \$100 thousand worth of tools in 1954.

A 2-year interval between shows is favored by 50.7 pct of the users, a 5-year interval by 29 pct, and a show every year would be good news to 20.3 pct. But considering only plants that bought \$100 thousand or over in 1954, almost half favor every fifth year.

This means, simply, that the bigger purchasers, those with most at stake, and with whom exhibitors have most at stake, want longer intervals. Some believe that a machine tool show should be held only when builders have accumulated enough developments in cost-cutting models to warrant a show—regardless of time interval.

Autumn leads spring as the most convenient time of the year to hold the show, with 35.4 pct favoring fall, 28.4 pct preferring spring, 12.8 pct voting for winter, 9.7 pct for summer, and 13.9 pct with no preference.

Some large machine tool users like the show to be held in the fall, just in advance of preparation of machine tool budgets. This indicates that the show will have a good effect on builders' sales for 1956.

The perennial choice of conventioneers, Chicago, it the enthusiastic choice of 44.6 pct of the respondents as the best spot to hold the show. Cleveland, with only a 19 pct vote, is second and the remainder favor other cities from coast to coast without any significant choice. A few favor rotating the site.

Most show-goers are interested in general purpose tools. Many are interested in both, while a minority are primarily interested only in special tools. The breakdown of replies shows 733 interested in general purpose machines, 264 in both types, and 195 in specials.

By combining votes for both types, the result is 68.5 pct primarily interested in general purpose, 31.5 in special.

In probing factors that will stimulate replacement of old machine tools, three factors were presented. They were: accelerated depreciation write-offs, leasing arrangements, and more liberal financing.

Of those reporting, 955 believe that accelerated depreciation write-offs, if they could be obtained, would do most to encourage new tool buying programs. Leasing arrangements attracted 407 votes and more liberal commercial financing, 364.

Virtually every buyer checks performance against anticipated results. A full 97.7 pct of buyers employ systematic checks to determine whether or not their machine tool purchases live up to expectations.

Table I-Sizes of Plants in Field Sample

Sizes of Plants	Reporting Plants	Pct
100 to 250 Workers	546	45.2
250 to 500 Workers	272	22.5
500 to 1,000 Workers	193	16.0
1,000 to 2,500 Workers	130	10.8
Over 2,500 Workers	44	5.5
	1,267	100.0

Table II-What Influences Replacement

Faciers	No. of Yole
Accelerated Depreciation Write-offs	95
Leasing Arrangements	40
More Liberal Commercial Financing	36

Table III—Interest in Special-Purpose vs. General-Purpose

																No. of Votes
Special-purpose machine	tools		. 0				D	0	0		0 1	 			0	195
General-purpose machine																
Interested in both types				0	0 1	 	0	0	0	,	0 1			0		264
															7	1 192

By combining the 264 votes for both types, here is the result

			No. of Votes	Pct
Special-purpose	machine	tools	459	31.5
General-purpose	machine	tools	997	48.5
			1.454	100.0

How Machine Tool Buyers Upped Estimates

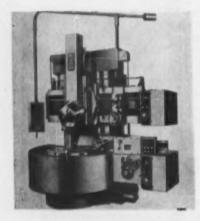
TREND of machine tool purchases for 1955 by 1207 metalworking plants as anticipated in February and showing upward revision in June.

	<u> </u>	e 1	1	1	* N
S. I. C. Ind. Code	Description of Industry Groups	Machine Tool Purchases in 1954 By Respondents	1986 Purchases As Viewed in February	1955 Purchases As Viewed in June	
18 25 3312 3351 3361 3421-3 3421-3 3431 3430 3441 3461 3463 3464 3471	Ordnance Equipment Metal Furniture & Fixtures Steel Rolling Mills Nenterrous Relling & Extruding Iren & Steel Forge Shops Tim Gans & Tinware Custery & Hand Tools Hardware Sinks, Plumbers' Supplies Heating & Gooking Equipment Fabricated Structural & Plate Products Vitroous Erameled Products Stampings Powder Metal Parls Lighting Fixtures	34, 488,000 \$1,149,200 \$2,300,000 \$180,000 \$ 946,000 \$ 345,500 \$ 603,429 \$5,410,700 \$1,429,300 \$3,243,000 \$1,470,500 \$1,670,500 \$ 266,000 \$ 266,000	+286% 8ame - 13% + 11% - 23% - 12% - 9% - 9% - 9% - 9% - 9% - 9% - 9% - 3% - 9% - 25% - 9% - 8% - 8% - 12%	+ 200% + 10% + 10% + 2% - 11% - 17% + 17% + 17% + 185% - 20% - 0.26% -	
3489 3493 3494 3495 3811 3519 352 3531 3532 3541 3542 3543 3543 3561 3852 3953	Springs & Wire Products Streit Springs, other than Wire Botts, Nuts, Scrows, Rivets Scrow Machine Products (Gustom) Steam Engine & Turbines Internal Comb. Engines, except auto & aircraft Apricultural Machinery & Tractors Gonstruction Machinery Oil Field Machinery Machine Tool Builders Other Metalworking Machinery Cutting Tools, Gages, Dies Food Machinery Toxtile Machinery Woodworking Machinery Woodworking Machinery	\$ 945,700 \$ 99,000 \$1,110,600 \$ 981,005 \$ 980,000 \$3,722,009 \$12,400,000 \$1,472,000 \$1,300,500 \$7,357,600 \$2,346,500 \$2,346,500 \$2,71,000 \$1,670,000 \$3,77,000	+ 9% + 24% + 14% + 17% + 29% + 18% - 18% - 14% + 2% + 41% + 41% + 43%	+ 10% + 24% + 24% + 9% + 9% + 40% + 10% + 10% + 27% + 27% + 25% + 10% + 50% - 9% + 70%	7
3664 3665 3569 3561 3562 3563 3564 3566 3566 3566 3566 3571 3576 3576	Paper & Pulp Machinery Frinting Machinery Special-Industry Machinery Pumps & Compressors Elevators. Conveyors, Granes, Heists Blowers & Ventilating Fano Industrial Trucks Mechanical Power Transmission Equipment Stokers Other General Industrial Machinery Computing Machine & Cash Registers Scales.	\$ 855, 000 \$1,20,000 \$1,547,000 \$2,776,000 \$ 280,000 \$ 705,500 \$ 381,500 \$ 422,000 \$3,30,500 \$ 763,000 \$ 773,000 \$1,663,500 \$ 72,000	+ 10% - 0% + 20% - 0% + 0% - 5% - 10% - 11% - 11% - 11% - 40% - 7%	+ 37% + 4% + 35% + 13% + 17% + 18% - 18% + 18% - 18% - 31% + 48% - 7%	
3581 3583 3584 3586 3591 3592 3893 3811 3814 3618 3619 3619 3619 3619 3619 371 3722 3731 3722 3731 3731 3739 3611 3739 3731 3739 3611 3739 3731 3739 3731 3739 3731 3739	Other Office & Saire Machines Laundry Equipment Sewing Machines Vacuum Gleaners Netrigerators Service-Industry Machines Valves Fabricated Pipe & Pipe Fittinge Ball & Roller Bearings Machine Shope—Jobbing Electric Wiring Devices Electric Meters & Instruments Electric Meters & Instruments Electric Motors Power Transformers Elec. Controls, Switchgear Misc. Elec. Industrial Equipment Electric Appliances—Other Insulated Wire & Cable Electric Equipment for Transportation Equipment Motor Vehicies & Parts Aircraft Engines Aircraft Engines Aircraft Engines Aircraft Engines Aircraft Engines Aircraft Engines Relication Equipment Misc. Electric Equi	\$1,410,000 \$140,000 \$244,600 \$4,911,000 \$1,320,000 \$1,345,000 \$1,2725,000 \$7,784,000 \$1,004,000 \$1,004,000 \$1,004,000 \$1,004,000 \$1,004,000 \$1,004,000 \$1,004,000 \$1,778,000 \$1,005,000 \$1,778,000 \$2,015,243 \$1,212,103,000 \$1,778,000 \$1,788,000	- 386 20% 20% 20% 20% 20% 20% 18% 18% 18% 20% 20% 25% 25% 25% 21%	+ 23% + 42% + 70% + 23% + 23% + 23% + 23% + 23% - 23% - 23% - 22% - 35% - 22% - 35% - 25% + 45% - 25% + 45% - 24% - 24% + 45% - 24% + 24%	
384 387 391 393 394 3951 396 3871 3980 399	Surgical & Dental Instruments. Photographic Equipment Clocks, Watches, Clock Devices Jewelry, Silverware. Musical Instruments. Toys & Sporting Goods Mischanical Pencils, Pens. Coatume Jewelry, Silde Fasteners. Plastics. Wire Brushes Metal Caskets. Signe, Soda Fountains	\$1,772,000 \$ 778,000 \$ 411,580 \$ 1,000 \$ 386,000 \$ 282,500 \$ 25,000 \$ 200,000	+ 12% + 9% + 30% - 3% - 13% - 2% - 2% - 2% - 89% 8ame + 16%	+ 13% + 10% + 20% + 25% + 25% - 14% Sama + 4% - 11% Same + 19%	
	Entire Survey	\$286,726,000	- 7.5%	- 0.6%	

PREVIEW

MAGNINE TOOL SHOW CHICAGO

Pictured and described in this section are some of the ultra-modern metalworking equipment items to be displayed at The Machine Tool Show. Show site is Chicago's International Amphitheatre; dates of the exposition are September 6 through 17, from 10:00 am to 5:00 pm daily.



More power for vertical turning and boring

Two new vertical turning and boring machines—one single column 36-in, size and one double column 56-in, size—are fully re-engineered to take full advantage of modern cutting tool capabilities. Ratings are 40 to 50 hp on 30 to 46-in, machines; 75 to 100 hp on sizes 56 in, and up. Twenty-four feeds and an equal number of speeds are available. To reduce operator fatigue, some controls are pendant-mounted; others are on a side head panel.

The pendant controls speed preselection and changes; feed and rapid traverse of all heads; swiveling of rail heads; turret index; and table stop. Panel on side head controls main drive motor; rail positioning; thread cutting; taper turning; and coolant pump. Many other new features add to rigidity. King Machine Tool Div., American Steel Foundries, Booth 1121.

For more data circle No. 29 on postcard, p. 249.

Hydraulic press has no high pressure lines

In these hydraulic presses, used for drawing, forming and similar metalworking operations, high pressure piping is eliminated from the main hydraulic circuit. The fluid is conducted through short, direct passages drilled in the structural parts. There is no oil drippage from loose fittings or leaky welded joints, which is often a major cause of downtime and burdensome maintenance expense. The "pipeless" press on display will be

a 150-ton unit. Another press to be demonstrated is a 100-ton C-frame model, typical of a versatile line made for forcing, straightening, bending, forming, and similar work. The basic forcing press has a "U" gap in the bed. For straightening, a table may be added; for forming, a bolster plate can be used. Elmes Engineering Div., American Steel Foundries, Booth 1121.

For more data circle No. 30 on postcard, p. 249.



Grinds slots or shoulders to close tolerances

The model 824 hydraulic-feed surface grinder, shown for the first time, has a ballway cross feed and an anti-backlash cross feed screw for greater precision in grinding slots and shoulders to close tolerances. Several hand-feed grinders to be displayed will feature vari-

able, stepless spindle speed control, achieved by electronic means. The control device is reported accurate within 5 pct in maintaining constant peripheral speed; and it requires little maintenance. Abrasive Machine Tool Co., Booth 317.

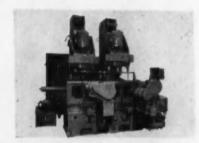
For more data circle No. 31 on postcard, p. 349.

Tape control positions work table accurately

The new Jigmatic tape controlled electronic digital positioning table automatically positions a workpiece under or in front of a drill, tap, boring tool or the like. It eliminates the need for an operator to move a drilling head, an arm, or a slide to positions indicated by reading a dial, taking a vernier measurement or setting stops. Because the tape controls all movement and accuracy of positioning, the machine operator is responsible only for the machining operation. No layouts are necessary and work setups are simple and quick. The tape is punched from engineering drawings, with holes dimensioned decimally from X and Y coordinates. A template type hand punch can be used for tape preparation. Arter Grinding Machine Co., Booth

For more data circle No. 32 on postcard, p. 249.





Transfer machine for semi-high production

A 3-unit transfer machine in operation will demonstrate its value for semi-high production jobs as well as its feasibility for varied production requirements. It is patterned after the smaller 2-unit machine shown here, but contains many new and heavier tooling developments, including: Newly designed units for combination boring and counterboring at one station; cross feed facing at the second station; and multiple drilling at the third station. Baker Brothers, Inc., Booth

For more data circle No. 33 on postcard, p. 249.

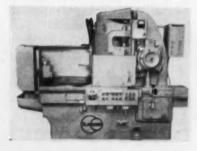
Vertical hobber loads and gages automatically

Designed for continuous rather than general purpose work, this machine will hob gears up to 3-in. diam by 6-in. face width. Pitch capacity is 10 DP. The machine shown has a vibratory-hopper loader and a gaging mechanism that segregates gears of correct size from those over or under. An automatic hob shifter can be set to shift a certain amount after each

cycle, or after a fixed number of gears have been cut. The hob is set to proper depth by a centerdistance adjusting mechanism which requires only a simple dial setting. Machine construction is heavy and rigid for accurate, high speed production. All functions are interlocked. Barber-Colman Co., Rooth 1322.

For more data circle No. 34 on postcard, p. 249.

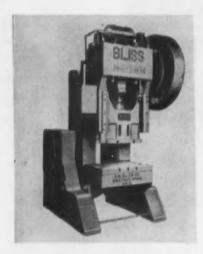




Surface grinder has automatic cycle control

Seven years of development precede the first showing of this No. 18-C grinder which accomplishes by automatic cycle control most of the operations performed by an operator on the standard No. 18 model. For regular production on suitable work, the new control will hold a tolerance of ± 0.0005 in. After initial setup, the operator simply loads work on the magnetic chuck, closes the chuck current circuit and presses the "cycle start" button. The grinder completes the cycle, returning the chuck to the loading position. The Blanchard Machine Co., Booth 406.

For more data circle No. 35 on postcard, p. 249.



Enclosed frame OBI's have big press features

This 75-ton OBI introduces a new series on inclinables which range up to a 200-ton size. All feature a totally-enclosed frame design and box-type crown for added rigidity to achieve longer die life. They also have motorized inclining mechanisms for faster setup changes; new automatic rotary limit switches; return oil systems; and new air clutches. Die spaces and all electrical controls conform to JIC standards. Controls can be built into the box type legs or mounted on the frame. Slide ad-

justments can be motorized to speed die settings. Complete new lines of straight side, knuckle joint and high production presses will also be demonstrated for the first time. Other recent developments in auxiliary equipment will be shown, including a new air friction clutch, automatic feeds, and a new automation control switch. Four new movies on press topics will also be previewed. E. W. Bliss Co., Booth 1414.

For more data circle No. 36 on postcard, p. 249,

Screw machine works plastics or alloy steels

With a maximum spindle speed up to 7200 rpm, plus rigid construction and push button control, the new No. 00 automatic screw machine is designed for fast, closer tolerance work on all stock to ½ in. in materials from free-cutting plastics to tough alloy steels. Because of its sturdy construction, carbide tooling can be used to good advantage on many jobs. Hardened and ground ways, precision ball bearings in spindle and sprockets, and fully automatic lubrication are

intended to keep maintenance problems to a minimum. The spindle speed range is from 34 to 7200 rpm, with 208 high and low speed combinations in ratios from 2.3:1 to 16:1. Speed variation and directional changes are made by simple pick-off gears; positive chain drive of the spindle at all speeds assures adequate power throughout the full range. All controls are convenient. Brown & Sharpe Mfg. Co., Booth 520.

For more data circle No. 37 on postcard, p. 249.



Drilling machine makes instant speed changes

A new variable speed drive on the "RPMster" drilling machine eliminates all drive gears and confines spindle speed changes to two speed ranges, high and low. The 88-in. tall drill has a capacity up to 1 in. in cast iron; up to \(^3\)/4 in. in mild steel. Low range on the machine includes all speeds between 100 and 550 rpm; high range produces spindle speeds from 500 to 3000 rpm. Moving a speed control lever on the left side of the drill head

housing shifts from one range to another without back gearing; while a crank on the right adjusts to the desired speed within each range. Speed changes within each range are adjusted instantly; those requiring a change of range take no more than 10 to 15 seconds. Machine operation is said to be exceptionally smooth and quiet. Buffalo Forge Co., Booth 610.

For more data circle No. 38 on postcard, p. 249.

Movable pendant controls all tool functions

The new model 75 horizontal boring, milling and drilling machine will be exhibited in 3 and 5-in. sizes. Both will be equipped with the movable pendant that controls these machine functions: Feed and traverse of spindle, head, table and saddle; speed rate changes; rotation of spindle and head binder; and selection of feed rate in inches

per minute or inches per spindle revolution. The 5-in, machine will feature electronic automatic positioning which is optional equipment. In all, 6 machines of 4 basic types will demonstrate the trend toward greater productivity. The Bullard Co., Booth 1213.

For more data circle No. 39 on postcard, p. 249.





"Detector" panel cuts maintenance costs

The Electro-Graphic maintenance detector system shown here will be fully shown for the first time. It is said to make possible up to a 90 pct reduction in electrical maintenance costs. A scale model of a complete plant layout will show how skillful production line planning may be combined with automatic machining methods to reduce operating costs. The model will

show the latest developments in hydraulics, electrical controls and mechanical work handling units. Other portions of the exhibit will feature a fully equipped 5-station operating section of a 26-station transfer machine built to handle certain automobile cylinder head operations. W. F. & John Barnes Co., Booth 1223.

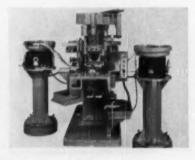
For more data circle No. 40 on postcard, p. 249.

Gears honed on production basis

Bores of transmission gears will be honed on a production basis with this new model 111 honer designed for precision work of 3-in, length. The machine is equipped with airelectric hone expansion; Plugmatic bore - to - bore sizing; automatic loading; special gaging equipment; and Barnesdril honing tools. Two other completely new equipment items will be among the various machine tools on demonstration. They are the model 7/8U heavyduty drilling machine, and the model 64 standard hydraulic drilling machine of 3/4-in, capacity, Barnes Drill Co., Booth 818.

For more data circle No. 41 on postcard, p. 249,





Machine assembles storage battery caps

This model 41-20 dial type automatic multiple spindle machine is a standard unit which automatically assembles a new type of plastic filler cap for storage batteries. It has two vibratory hoppers to feed the upper and lower cap members to the automatically indexed dial. One drill spindle removes any molding flash in the vent hole, and then

a special attachment coats the lower member with adhesive. The next station presses the two cap halves together. Finished caps are ejected at the rate of 30 per minute. A larger unit will operate to machine and insert screws in die cast brackets. The Bodine Corp., Booth 209.

For more data circle No. 42 on postcard, p. 249.



Special panel illustrates machine functions

This model 3216 automatic internal grinder will demonstrate straight bore grinding by grinding the bore in Shelby tubing at a rate of 60 pieces per hour. Stock removal is 0.010 in. to produce a hole diameter of 2.862 + 0.0003 in., over a 4-in. length. The finish required for this job is 10 to 15 microinches. A system of colored lights will

show how the machine functions throughout the entire grinding cycle. A special panel will be attached to illustrate how the machine's precision cross slide and automatic controls operate. Five additional equipment items will also do production work. Bryant Chucking Grinder Co., Booth 1015.

For more data circle No. 43 on postcard, p. 249.

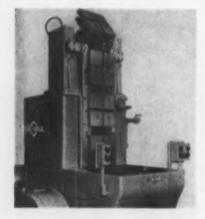
Console programs entire drilling operation

Faster and more economical hole drilling production are said to be possible with the new Carlton-Leber speed-feed pre-selector and program systems. Blueprint data transferred to the programming console actually pre-sets speeds and feeds for an entire drilling program. For less lengthy or compli-

cated drilling jobs, the programming unit may be disconnected through a switch so that only the pre-selector becomes operative, and speed and feed for the next operation can be selected while the machine is under cut. The Carlton Machine Tool Co., Booth 919.

For more data circle No. 44 on postcard, p. 249.





Endless-chain broaching offers versatility

By mounting a series of broach carriers on an endless chain, this new One-Way surface broaching machine achieves virtually continuous metal removal. Broach carriers move downward on the front of the machine, entering precision ways before contacting the work to insure accuracy. The workpiece remains stationary in suitable holding fixtures. After entering the ways the broach carriers become individual rams. The chain applies

only down-pull on the ram; gibs and ways support the ram while the teeth are cutting. The chain principle lengthens the broaching stroke of a relatively small machine. A completely mechanical drive, and infinitely variable cutting speed from 10 to 50 sfpm, enhance the unit's versatility. With no return stroke, cycle times can be reduced. Colonial Broach & Machine Co., Booth 1112.

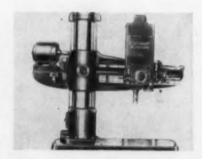
For more data circle No. 45 on postcard, p. 249.

Dials pre-select radial drill speeds

Two conveniently located dials allow complete pre-selection of speeds and feeds on this new radial drilling machine, thereby eliminating the customary speed and feed change levers. Pre-selection of any of the 36 speeds and 18 feeds that are available may be done during drilling or tapping operations

while the spindle is rotating in either forward or reverse direction. Standard equipment includes a simple, direct reading pre-scheduling device for programming any job. A separate programming unit is unnecessary. The Cincinnati Bickford Tool Co., Booth 901.

For more data circle No. 46 on postcard, p. 249.



Pendant control simplifies tool operation

This compound table-type horizontal boring, drilling and milling machine has a 41/2 in. diam spindle. It is equipped with power preselective speeds and feeds, directional control of movements to all units, control of power rapid traverse, and control of spindle from its pendant push button station. The same pendant station controls automatic positioning of the head and table. Other features are saddle supports and under-the-floor runways. The Cincinnati Gilbert Machine Tool Co., Booth 816.

For more data circle No. 47 on postcard, p. 249.





New shaper has single lever control

Designed for greater accuracy, a faster rate of metal removal and better all around performance, this 42 in. all steel shaper is completely new. It has a hooded, triangular Corten ram for maximum stiffness: a steel table and rail for minimum deflection; 16 cutting speeds from 25 to 400 fpm; and dial speed selec-

tion while the ram is idle or in motion. Numerous other features include single lever control from either side of the machine; instantaneous reverse at any point in the stroke; and horizontal and vertical power rapid traverse. The Cincinnati Shaper Co., Booth 1105.

For more data circle No. 48 on postcard, p. 249.

Press clutch boosts stamping production

A new 2-speed planetary gear clutch triples the speed of the slide during the upstroke and approach portions of the cycle on this twin geared, double crank, double action press. An oscillograph will be set up to record the speed and motion of the slide, and for more convenient viewing, this visual record will be shown on a large television screen. An animated display will provide a

clear visual comparison between the operations of the Clearomatic press and other standard and accelerated slide motions. Six other presses will be shown, including OBI and straight side types with mechanical and hydraulic drives and single and double action slides. Clearing Machine Corp., Booth 716.

For more data circle No. 49 on postcard, p. 249.





Press linkage shortens deep drawing cycle

To be exhibited for the first time. the Hi-Draw press was developed for high production rates on deep draw work. Standing 16 ft 8 in. above the floor, it is rated at 215 tons. The press is designed to operate at high speeds during the nonproductive portion of the ram stroke, and at a slower, correct speed during the working part of the stroke. A new linkage permits this quick approach and quick return, as well as the slow constant ram velocity through the drawing range. Also to be exhibited is a new shear that operates on the pivoted blade principle and will cut mild steel to 12 ft x 1/2 in. Third equipment item to be shown is a versatile bending press. Steelweld Machinery Div., The Cleveland Crane & Engineering Co., Booth 1418.

For more data circle No. 50 on postcard, p. 249.



Drill tapper uses universal joint head

The Cleveland Jr. multi-spindle drill tapper is designed to be a flexible, accurate and economical machine for multiple small-hole drilling and tapping. Its universal joint head offers maximum flexibility in bolt circles or arrangement of spindles. It will drill up to 8 No. 25 holes or taps No. 10-32 holes within a maximum bolt circle of 8 in. The standard head has 8 spindles adjustable to a minimum distance of 11/16 in.

between spindles. In operation, the head remains stationary and the table is raised to bring work in contact with the tools. The motor reverses to withdraw tools at the point of desired depth. Auxiliary devices can be obtained to equip the machine for completely automatic operation. The Cleveland Tapping Machine Co., Booth 409.

For more data circle No. 51 on postcard, p. 249.

Flame-hardened drill column resists scoring

This 3-ft arm, 7½-in. column radial drill, the Hardelad, has a flame-hardened column designed to retain built-in accuracy and prevent column scoring. It features 2-lever, direct-reading spindle speed and feed shift dials, with all controls grouped for convenience. The No. 3 Morse taper spindle is alloy steel, mounted in four anti-friction bear-

ings of ample capacity. Nine spindle speeds and 6 power feeds are provided. The internal mechanism is forced-spray lubricated. Power is transmitted through a silent chain and drive shaft; no main drive parts are concealed in the head. Cincinnati Lathe & Tool Co., Booth

For more data circle No. 52 on postcard, p. 249.





Jig borer positions work automatically

This new jig borer will be demonstrated on ultra-precision layouts. Boring, drilling and tapping operations will be performed on an almost completely automatic basis. A departure from former designs in both structural concepts and function, work positioning on this model

is automatic and requires no manual handling for table and saddle slide operation. The structure supports heavy work throughout the machine range and maintains table and saddle alignment. Cleereman Machine Tool Co., Booth 1907.

For more data circle No. 53 on postcard, p. 249.

Small bar machine will make valve seat screws

Among the 6 bar machines and 2 chucking machines to be demonstrated at this booth, one is a 9/16-in. size, 6-spindle, bar unit; a new entry in the small automatic bar machine field. It will operate to make a valve seat screw from $\frac{3}{2}$ in. hexagonal brass stock. In another demonstration, a $\frac{3}{2}$ -in. 4-

spindle bar machine will feature a 100 pct carbide toolup in making a simulated outer bearing race from cold drawn 8620 bar stock. This is one of 7 models in a line of quick job-change machines. The Cone Automatic Machine Co., Inc., Booth 401.

For more data circle No. 54 on postcard, p. 249.

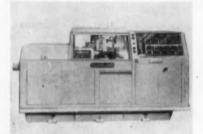


Transfer machine has interchangeable units

This 19-station Transfer-matic will be at work milling, drilling, chamfering, reaming and tapping to produce main crankshaft bearing caps at the rate of 450 per hour (at 100 pct efficiency). Features include: hydraulic power clamping; tandem drive for locating pins; hydraulic feed and rapid traverse for machining operations; individual lead screw for tapping; automatic lubrication system; drag chain chip conveyor; and hardened and ground ways. The Cross Co., Booth 1118.

For more data circle No. 55 on postcard, p. 249.





Dials adjust automatic screw machine feeds

The 1% in. model AB Dialmatic is an entirely new single spindle automatic equipped with an electric feed drive which provides separate, infinitely adjustable forward and reverse feed rates for each of its 5 turret positions. No cam changes are necessary. A new feature also permits infinite variation of spindle

speeds (without change gears) through the entire 40 to 3200 rpm spindle speed range. This is also done by setting dials and switches on the control panel for most efficient forward or reverse speeds. The Cleveland Automatic Machine Co., Booth 412.

For more data circle No. 54 on postcard, p. 249.

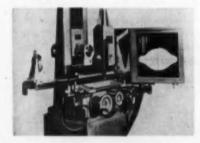
New bed type miller has power for carbides

Standard Hypowermatic milling machines are built in 42 sizes in both plain and duplex styles, offer drives up to 50 hp for continuous operation on medium to larger size parts. Spindle speeds to 2000 rpm are available for conventional or climb milling with high speed steel or carbide cutters. The machines have auto-

matic 2-way table cycles and infinitely variable feed rates. Tables are driven by a new type of hydraulic motor unit which is enclosed within the bed for protection from dust and grit. The Cincinnati Milling Machine Co., Booth 1205.

For more data circle No. 57 on postcard, p. 249.





Matched-lens system gives true grind picture

The Visual-Grind machine's precision optical system with carefully matched lenses is said to give exceptional trueness and definition for accurate surface form grinding in tool room operations. Machine controls are conveniently accessible above the heavy base casting. Other fea-

tures include automatic table traverse; variable stroke and speed; and a one-shot Bijur lubrication system. Primary goal is maximum grinding accuracy with minimum time and effort. Cleveland Grinding Co., Booth 810.

For more data circle No. 58 on postcard, p. 249.

Tilting head on tool grinder adjusts easily

Equipped with a Pope tilting head and a 1 hp direct motor driven spindle, this completely new No. 12A universal cutter and tool grinder is designed for versatility to save time and money on setups. It will permit the use of cup wheels for practically all clearance angles, and grind

most cutters and reamers all over with a single setup. Operating controls are at both front and rear. The machine can be adapted for cylindrical, internal and wet grinding. Covel Mfg. Co., Booth 720.

For more data circle No. 59 on postcard, p. 249.





Heavy duty press will use progressive dies

Focal point of this exhibit will be a 100-ton capacity Autofeed press in operation. This heavy duty, 2-point geared, eccentric shaft-drive press will demonstrate its capacity for high speed stamping. It will use progressive dies and operate under actual production conditions. A newly designed coil cradle, automatic feed device and scrap cutter will work in conjunction with the press. Other presses to be displayed are a 200-

ton capacity single action straight side press and a 400-ton capacity double action straight side press. A special portion of the exhibit will demonstrate how the Danly aircooled, air-operated press clutch and brake work during repeated "inching" and single stroking. Danly Machine Specialties, Inc., Booth 1302.

For more data circle No. 60 on postcard, p. 249.

New index table permits "jigless" boring

The model 2B-36 Spiramatic Jigmil is completely new. It is designed to meet an increasing demand for a smaller machine for the "jigless" boring of production parts and the machining of jigs, fixtures and experimental pieces. The unit has a $2\frac{1}{2}$ -in. diam spindle with No. 40 NMTB taper, 12 in. bar feed, 24×10^{-2}

36 in. table, 36 in. horizontal travel and 24 in. vertical travel. Additional features include automatic positioning to horizontal and vertical slides; power operated tool lock mechanism; and a new type index table. DeVlieg Machine Co., Booth 1317.

For more data circle No. 61 on postcard, p. 249.



Drilling machine for continuous production

This model 4F drilling and tapping machine features infinitely variable speeds to 2200 rpm and a capacity in cast iron of $1\frac{1}{2}$ in. Designed primarily for heavy duty work on a continuous production basis, it has a 12-in. overhang. Pedestal models are available with 1, 2, 3 or 4 spindles. Also to be displayed for the first time is a model 1F sensitive drilling machine for light precision

work. It has infinitely variable speeds to 10,000 rpm, adjustable spindle tension control, 7-in. overhang, and 3%-in. capacity. A medium model 2F machine, also with the infinitely variable speed feature, comes with 8, 12 or 15-in. overhang and 1¼ in. capacity. Edlund Machinery Co., Booth 115.

For more data circle No. 62 on postcard, p. 249.

Tool grinder line covers light to heavy work

Four models make up this completely new line of tool grinders, which range from precision units with 6-in. wheels to heavy duty machines using 14-in. wheels. All are double-end machines with reversible motors for proper wheel rotation for both right and left hand tools. For straight surfaces and accurate tool angles, grinding is done on the faces of plate-mounted wheels. Tool

rest tables are large for firm support and are easily adjustable, either to the required tools angles or to compensate for wheel wear. Silicon carbide, aluminum oxide or diamond wheels may be used. Wheels are well guarded and coolant models have efficient splash guards. Ex-Cell-O Corp., Booth 1819.

For more data circle No. 63 on postcard, p. 249.



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See the modern machines that will help you win "Production Oscars"

We invite you, while you are in Chicago, to visit our Coliseum exhibit and also the Kling plant. See first hand the machines that have been winning "Production Oscars" in "the best of companies."

Let us show you all of the many features of these machines and give you actual instances of the time and

labor savings, production increases, and product improvements that Kling Machines are effecting on such jobs as cutting, punching and shearing beams, channels, angles . . . shearing round or flat bars . . . rolling structural shapes . . . making special cuts like flanging . . . slitting . . . or coping metals.

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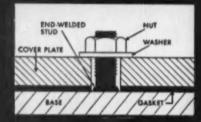
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Pfft! A split second with a NELWELD gun and you've got a sturdy end-welded stud right where you want it . . . ready to line up with the cover plate hole. That's real speed!

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CITY AND STATE

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COMPANY

ADDRESS

Jig grinder

This machine combines the Moore jig grinding head and the Fosdick automatic positioning table. The speedy, convenient table automatically positions work to ± 0.0001 in. A special feature of the machine is its ability to grind cylindrical

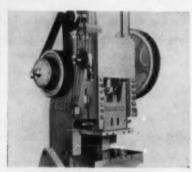


and tapered holes. An angular and indexing device built into the main spindle, and a newly developed slot grinding attachment, permit the quick, accurate grinding of any contour, whether regular or irregular. The machine has an infinite range of grinding speeds—from 12,000 to 60,000 rpm. Automatic positioning works from direct-reading dials. The Fosdick Machine Tool Co., Booth 1402.

For more data circle No. 64 on postcard, p. 249.

Press clutch

This new 200-ton OBI press with counterbalanced box-type ram conforms completely to JIC standards. As standard equipment it has a new air-powered, electrically-controlled friction clutch with interconnected



brake and single point adjustment. The clutch and brake assembly provides quick, accurate control for start-stop operations. The same box-type ram design is also avail
For more data circle No. 65 on postcard, p. 249.

PREVIEW | MACHINE TOOL SHOW CHICAGO

able in 110 and 150-ton models. All three machines will handle a variety of cutting, punching, stamping, shallow drawing and forming operations. They can also be adapted for completely automatic press work. Ferracute Machine Co., Booth 1311.

For more data circle No. 66 on postcard, p. 249.

Multi-spindle drill

The completely new model E-60-HT multiple spindle drilling and tapping machine features hydraulic feed for drilling and individual lead-screw feeds for tapping operations. The 12 x 24-in. adjustable



spindle head is equipped with 16 spindle pinions for 1% in. universal joints. Head and slide are counterbalanced hydraulically. Spindle speed change over the 202 to 990 rpm range is made by pickoff gears located in an accessible case a-top the head. Both the drill and tap cycles are automatic, initiated when the "cycle start" button is pushed. Advance and return rates are rapid. Fox Engineering Co., Booth 419.

For more data circle No. 67 on postcard, p. 249.

New double disk grinder

New precision and uniformity in high production grinding of paral-

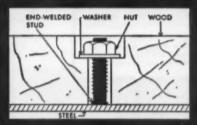




"STUD" NELSON FASTENS WOOD to STEEL IN A FLASH!

Shipyards and railroads have long been users of the NELWELD system of securing wood decking—and builders fasten wood nailers the same way.

In like manner, designers of skids, pallets, dollies and other wood-and-steel products are also benefiting by the NELWELD 10 method. End-welded studs are a "natural" in designing outside surfaces free from bolt heads and projections—saves drilling and tapping the steel members, too.



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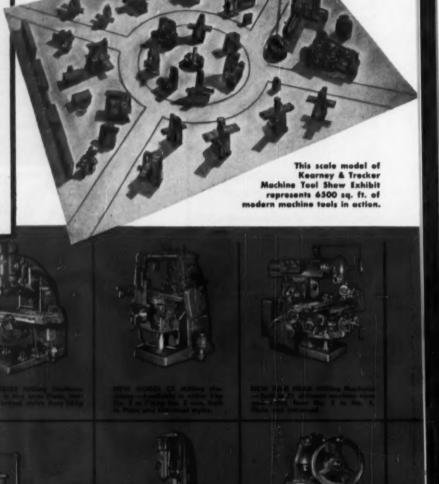
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- * New TF Series Milling Machine—strikingly new models featuring remarkable twinscrew knee support.
- * New Medel CE Milling Mechines the simplified, precision-built, economy producer for schools, maintenance and small tool
- * New Ram Head Milling Machines versatile performers featuring combination arrangements of horizontal, vertical and universal spindles.
- * New Mil-waukes-Mil Series Milling Machines — flexible, power laden, broad capacity, bed-type production tools.
- New Autometric Precision Boring Machines — superb vertical models introducing a non-wearing twin-screw measuring system.
- New Automatic Transfer Machines Quill Feed unit, Way-Type Drilling unit, Lead Screw Tapping unit, Rotary Index Table, Feed Slide.
- * New Computer or the precision indexing computer for rotary tables and dividing heads.
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milling and precision index computing; automatic transfer type equipment — all of this and more to be seen and demonstrated in Booth 508.

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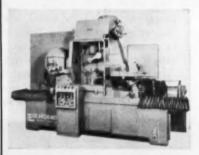


CONDENSATE PUMP TANK

lel flat surfaces are now possible on a new double disk grinder which gives better rigidity and accuracy. Pump gear blanks, for example, can be parallel ground at the rate of 885 parts per hour on a machine tooled for automatic loading and unloading, rotary work carrier and automatic size control. Stock removal from the blanks is 0.010 to 0.018 in., with tolerances of 0.0003 to 0.0005 in. for flatness and parallelism, and 0.001 in. for uniformity. Gardner Machine Co., Booth 1115. For more data circle No. 68 on postcard, p. 249.

Spline grinder

High production and consistently high quality are attained with a flute or spline form grinder which incorporates a number of features for fully automatic operation. For

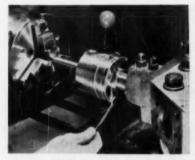


example, the machine can be hopper fed or magazine loaded, as desired. Defective workpieces are rejected automatically, thus saving the time and effort of grinding. A stock equalizer locates the work relative to the grinding wheel—also done automatically. Trimming of the grinding wheel is also automatic The Gear Grinding Machine Co., Booth 315.

For more data circle No. 69 on postcard, p. 249.

Shank die head

The greatest drawback to producing an accurate thread is misalignment of the machine on which the threads are cut. Now, an aligning shank die head eliminates this problem. The operator simply loosens the screws that attach the shank to the front end of the die head and runs the die head with the chasers inserted onto the revolving workpiece. The front end of the die head,



being loose in relation to the shank, corrects any misalignment between the spindle and turret. While the chasers are still engaged with the workpiece, he stops the machine and tightens the screws that engage the shank. Geometric Tool Co. Div., Greenfield Tap and Die Corp., Booth 223.

For more data circle No. 70 on postcard, p. 249.

Vertical miller

Maximum rigidity and accuracy have been built into a new vertical milling machine to meet the exacting needs where high-speed steel and carbide cutters are used on heat-treated and die steels. It permits the use of small cutters running at high speed for delicate work and cutters up to 1-in. diam for rough hogging. The spindle has an



infinitely variable down feed from ¼ to 8 ipm. Spindle bearings are permanently grease sealed. The self-retracting spindle has both hand lever and micrometer down feed. For rigidity, the heavy column and base are strongly ribbed internally. The turret-type ram is of



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heavy box-type construction. Knee and column ways are of square lock bearing design with narrow center guide on the knee. Lubrication is by the one-shot system. George Gorton Machine Co., Booth 1019.

For more data circle No. 71 on postcard, p. 249.

Boring and turning

A new heavy-duty vertical boring and turning mill features specially designed box-type construction housings and an extra heavy bed and table unit to support loads up to 55 tons. Two precision anti-friction table tracks support these



heavy work loads. One bearing is nearly 8 ft in diameter. A large tapered roller bearing at the table's center prevents misalignment of the table or work due to radial thrust. Also, the machine is built for extra high speed ranges to make the best use of modern cutting tools. Speeds range from 0.7 to 60 rpm. The machine features an electronically controlled duplicator to provide two-dimensional tracing. Giddings & Lewis Machine Tool Co., Booth 710.

For more data circle No. 72 on postcard, p. 249.

Automatic lathe

One of three new machines for single spindle chucking, this machine, with tracer, takes four consecutive automatic passes from four templates, each of different length and different pattern. Another automatic production lathe—a vertical type—is also a high-production machine but takes less floor space and adapts to faster handling from either pallets or conveyors. Still another, referred to as the No. 12

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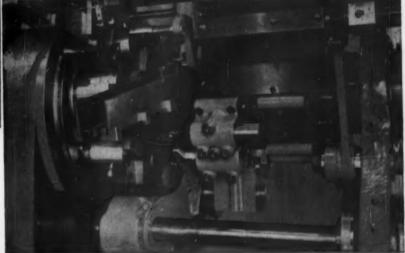


Automatically load. Rough and finish turn O.D. Drill, true bore and ream the small hole concentric with O.D. Face and chamfer end. Chamfer holes. True bore the counterbore. Trepan bottom of counterbore and automatically unload. Illustrations also show rough castings as fed to machine.



(Above) REAR VIEW OF TOOLING

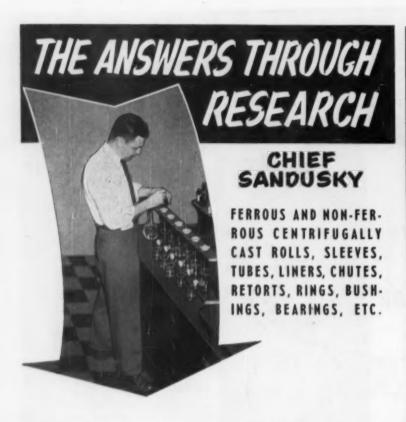
(Right) FRONT VIEW OF TOOLING Showing load chute at upper left . . . and unload chute at center . . . both at same station.



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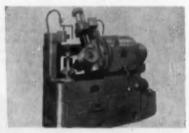


Automatic, includes automatic handling, automatic gaging, automatic tool setting and other such features. Gisholt Machine Co., Booth 1413.

For more data circle No. 73 on postcard, p. 249.

Compact hobber

New features on a helical gear hobbing machine not only make it more compact, but speed gear production. One of these is the feeding of the hob tangent to the helix of the gear



being cut with either of two basic cutting cycles—one of which provides three feed rates in series and the other comprises a fast enter infeed followed by the hobbing feed tangent to the helix. One pushbutton provides fully automatic operation. Gould & Eberhardt, Inc., Booth 1424.

For more data circle No. 74 on postcard, p. 249.

Rigid column and base

Heavy, rugged, one-piece column and base construction gives permanence of alignment between vertical headways and cross travel ways on a new hydraulic feed surface grinder. The head of the machine has a precision grease-sealed ball-bearing spindle carried on protected preloaded ball-bearing ways for ease of vertical movement and accuracy. Its working surface is 8 by 24 in. under a 10-in. diam wheel.

PREVIEW | MACHINE TOOL SHOW CHICAGO



Longitudinal table speeds range infinitely from 3 to 125 fpm. A large outer handwheel on the head, graduated in thousandths, provides coarse vertical head adjustment. A small inner wheel is graduated in tenths of thousands. Gallmeyer & Livingstone Co., Booth 906.

For more data circle No. 75 on postcard, p. 249.

Compact C-press

Features of a new C-press line include a high-speed differential circuit and inching control which allow the operator to literally inch the ram downward or upward while setting dies. The open C-gap frame eliminates encumbrances within the



tooling area and provides maximum room for tooling. The 60-sec ram stroke adjustment is conveniently located away from the tooling area. The sturdy, self-enclosed frame design features compact power units which can be removed easily. The relief valves provide an infinite range of tonnage regulation on all models in the line. Index tables may be used with the C-presses as workholders for carrying parts or material. Hydraulic Press Mfg. Co., Booth 718.

For more data circle No. 76 on postcard, p. 249.

You can trim drawn shells like these in a single press stroke!



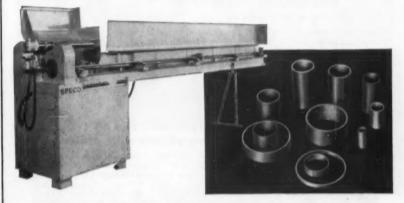
The Brehm "Shimmy" Die employs a radically new trimming principle . . . completely different from ordinary trimming methods. A cam action inside the die moves the shearing edges four ways—eliminating slow, costly "horn" and "pinch" trimming operations. You get a perfect edge finish every time , . . and a single die may be used for many different shapes. Production goes up fast. Production costs are slashed! Trims stainless and

mild steel, copper, brass, zinc, aluminum, gold, silver, fiber, rubber, plastics. Trims all sizes from fountain pen ferrules to refrigerator doors—in almost any thickness that can be drawn. Brehm Dies can be used in mechanical or hydraulic presses.

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The revolutionary Brehm Tube Cutter has a cutting action that makes it the finest machine of its kind ever built! Cuts tubes %" to 2¼" O.D.—with production speeds ranging up to almost 7,000 pieces per hour! With the Brehm shearing action, there is no loss of stock—no burred tube ends! Up to 25% more pieces from the same length of stock. Cuts almost any tubing—mild steel, stainless steel, brass, copper, aluminum, etc.



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cutting. Light occasional cross keyways and corner chamfers are planed without extra setting. The machine, which is very rigid, uses conventional planer tools. The G. A. Gray Co., Booth 1120.

For more data circle No. 77 on postcard, p. 249.

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ONE-WAY SHUT-OFF Shuts off one side of line

Gives quick connection and disconnection, with instant automatic flow or shut-off. To connect Coupling, and open line to flow of fluid, merely push Plug into Socket. To disconnect, a slight pull on sleeve releases Plug and shuts off supply end of line.



TWO-WAY SHUT-OFF Shuts off both sides of line

To connect, pull back sleeve and push Plug into Socket. Identical torpedo type valves permit free flow of gas or liquid through Coupling. To disconnect, pull back sleeve... Coupling immediately disconnects, valves automatically seal both ends of line. Female pipe thread connections from ½ to 1°. Available in brass or steel.

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Automatic miller

This machine, one of three ever built, automatically produces solidcenter auger bits from bar stock. Designed to solve an in-plant production problem, this new bit miller forms a complete battery of highproduction tools. While in operation, it makes the semifinished bits complete with a milled spiral and



also performs the heading operation. Greenlee Brothers & Co., Booth 1221.

For more data circle No. 78 on postcard, p. 249.

All operations hydraulic

A new thread milling machine of compact space-saving design is completely hydraulic in operation. It includes pumps and hydraulic motors for actuating the work and cutter heads. Being hydraulic, it permits balancing cutter speed and



work speed, plus rapid traverse, thus producing optimum cutting conditions. Spindle speeds are in-

PREVIEW | MACHINE TOOL SHOW CHICAGO

finitely variable to facilitate machining of unusual alloys. The machine will produce internal or external, straight or tapered threads up to a 4-in. diam, 9 in. from the collet nose. Once set up, the machine is semiautomatic in operation. It also features interchangeable lead and cross-feed cams. Hanson-Whitney Co., Booth 807.

For more data circle No. 79 on postcard, p. 249.

Bore-Matics

Two new cam-actuated Bore-Matics, identical in basic construction except for size and capacity, have been designed with a rigid base and hardened steel box-type ways. The scraped table ways are



under continuous pressure lubrication. A hydraulic gib not only maintains accurate alignment, but takes up automatically for any slight wear over the years. Although intended primarily for continuous high production of a single part, these machines are unusually simple to set up. The Heald Machine Co., Booth 902.

For more data circle No. 80 on postcard, p. 249.

Tracer lathe

A new lathe, which features a top tracer, completely eliminates the chip disposal problem. It is equipped with an automatic chip removal





The most efficient way to load, unload, transport and store lumber, pipe, her stock and other lengthy materials, is with this Towmator Hydraulic Roll-Off Accessory. It fits over standard pallet forks, and removes easily.

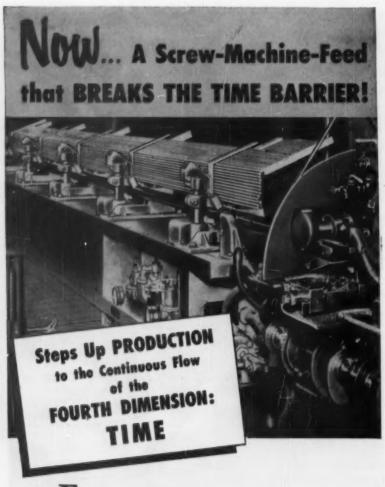
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This Chicago lumber yard reduced loading time 50% with the Towmotor Hydraulic Roll-Off Accessory. Job-planned Towmotors handle all types of material quickly and economically in all types of industries—receiving, processing, storage and shipping. Cost reductions up to 85% are common. See your nearby Towmotor Representative and write for Job Studies on your particular industry—to Towmotor Corporation, Div. 1508, 1226 E. 152nd St., Cleveland 10, Ohio.



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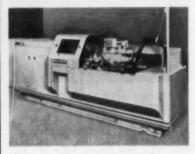


unit to remove the chips through an opening provided at the rear of the lathe bed. With this unit, plus the full-width, full-depth chip chute, chips are no problem with this tracer lathe even at the high rates of metal removal of which the machine is capable. The location of the tracer slide and template on the top carriage prevents dirt or chips from interfering with maximum lathe efficiency. With an auxiliary carriage, the lathe can face, groove and chamfer. Hydra-Feed Machine Tool Corp., Booth 301.

For more data circle No. 81 on postcard, p. 249.

Tracing lathe hogs metal

A great variety of combination cuts, feeds and speeds is possible on a sequentially controlled automatic tracing lathe. The heavy-duty machine can hog off metal up to a depth of ½ in. on either one, two,



three or four automatically controlled tracing cuts. A two-position automatic indexing tool holder permits heavy roughing with one tool and accurate finishing cuts with another. Feed and speed changes may occur automatically during a cut, insuring optimum cutting speeds on changing diameters and angles. Jones & Lamson Machine Co., Booth 1111.

For more data circle No. 82 on postcard, p. 249.

High output machine

A 5-station rotary indexing machine demonstrates how standard



THE IRON AGE

PREVIEW | MACHINE TOOL SHOW CHICAGO

units can be combined to form a special high-production machine. It mills six surfaces, saw cuts two ends and drills five holes in rear axle differential carriers for cars at the rate of 94 pieces per hour. It contains four 12-in. feed slides, one 16-in. feed slide, two drill units, one quill feed unit and a 60-in. rotary index table. Kearney & Trecker Corp., Booth 508.

For more data circle No. 83 on postcard, p. 249.

Radial drill

Conventional drilling operations, as well as horizontal, angular and compound angular drilling operations, can be performed with a new compact radial drilling machine. Features of this machine include a preselect automatic speed shifting



mechanism controlled from the pendant station and reduced overall size of the machine without reducing its working area or capacity. It can be used for either stationary or portable applications. Statistics: 4-in. spindle; 22-in. diam column; 10 to 20 spindle drive motor; 36-in. arm travel; 106-in. radial reach; 60-in. vertical headstock travel. Kaukauna Machine Corp., Booth 1210.

For more data circle No. 84 on postcard, p. 249.

Knee-type miller

Rigidity, accuracy and flexibility have been built into a knee-type milling machine for easier operation and to reduce costs on production work, tool and die work, or miscellaneous machining. Its spindle is powered by an individual motor through an efficient gear train which provides 18 speed changes over a range of 25 to 1500 rpm. An





Operator reoving completed iling diffusor g from Farquh draulic Press at Tuttle & Bailey, Inc., New Britnin.



FARQUHAR HYDRAULIC PRESS Makes New Product Possible

Tuttle & Bailey, Inc., New Britain, Conn., produces heating convectors, ceiling diffusers, grilles, registers, etc., as well as several defense products for the United States. When production of the ceiling diffusers was first planned, the company found they could not be manufactured with existing equipment at their plant.

Tuttle & Bailey then consulted with various hydraulic press companies, searching for a design to meet their requirements. Finally, the A. B. Farquhar Company came up with the best design—and at the lowest cost —a 450-ton press with pressing ram apeed of 0 to 45 in./min., approach and return speed of 390 in./min., and an operating hydraulic pressure of 2650 lbs./sq. in.

The company is very pleased with Farquhar's low maintenance cost, too. The press was installed in Aug. 1950, and has required no maintenance other than occasional gasket replacement-

Farquhar Presses Cut Your Costs

The above installation is just one more example of Farquhar performance in heavy production! Farquhar Presses are built-for-the-job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of extra-long guides on the moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

For our free catalog showing Farqu-har Hydraulic Presses in all sizes and capacities for all types of industry, write to: THE OLIVER CORPORATION, A. B. FARQUHAR DIV., Hydraulic Press Dept., 1503 Duke St., York, Pa.



THE OLIVER CORPORATION . A. B. FARQUHAR DIVISION

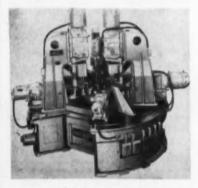


electrical spindle control eliminates couplings, friction clutches and other power-robbing devices. A separate feed drive meter also provides 18 feed changes over a range from % to 45 in. It has high speed power traverse in all directions. The Kempsmith Machine Co., Booth

For more data circle No. 85 on postcard, p. 249.

Indexing machine

A 12-station, 28-spindle automatic indexing machine, with a 100-in. diam base and 12 rotating work holding fixtures, has the ability to work on four faces and from the vertical. Seven automatic drilling and tapping units drive the 28 spindles. Work is rotated three complete turns during one trip around

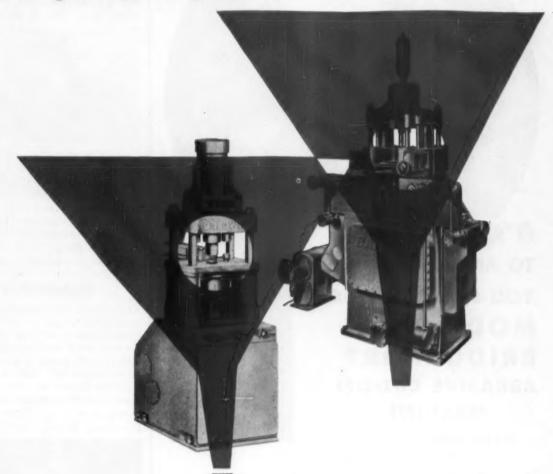


the machine, thus permitting subsequent operations in a hole each time it presents itself to the tools. The main table indexes 30° twelve times for one revolution while work holding fixtures rotate 90° counterclockwise each index of the table. The machine drills, countersinks, hollow mills, reams and taps in 14 holes. Kingsbury Machine Tool Corp., Booth 918.

For more data circle No. 86 on postcard, p. 249.

PRECISE FILLING

OF DIES by new Baldwin powdered metal presses makes compacts more uniform...



THEIR highly efficient shuttle type feeders enable Baldwin's new Model "L" and Model "C" powdered metal presses to compact parts much more uniformly. Air operated and cam controlled, this unique feeder moves from under a stationary hopper to a position over the die. It carries the same volume of material over the die cavity each time with a very smooth motion.

This shuttle is supported on guide rods with a spring loaded cutoff ring which prevents loss of material. Cleanline design of the feeder eliminates those recesses or projections that might keep the powder from filling the die cavity completely.

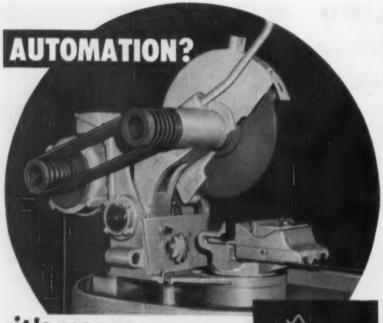
This is just one of the ways you'll benefit by specifying Baldwin Model "L" (50-ton) or Model "C" (100-ton) presses to meet the growing demand for powdered metal parts. These new presses are the very first designed specifically for use in compacting metal powders. Both feature sealed mechanisms, hydraulic heads, special fill adjustments, automatic lubrication and variable cycling.

For our new bulletins on "L" and "C" please write promptly to our Dept. 4769, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa.

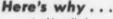


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- · Coolant applied equally to both sides of cut.
- Vise holds both ends of piece being cut.
- Abundant power supplied by 7 ½ H.P. motor.
- . Swivel head for accurate angle cutting.
- Accurate counterbalance of head by location of motor.
- · Heavyweight for long life and efficient operation.
- Complete automation produces close tolerances, increases production, saves labor.

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LOBDELL DIVISION

UNITED ENGINEERING AND FOUNDRY COMPANY

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Heavy-duty miller

Weighing 9400 lb, a new heavy-duty milling machine has been designed for fast milling of large-size workpieces. The No. 3-36 hydraulic miller has a 7½ to 10-hp drive

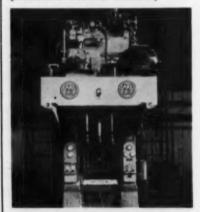


through the spindle and a speed range of 20 to 1050 rpm. It has been designed throughout for rugged performance. Its lubrication system for the table ways, spindle bearings and drive gears is entirely automatic. Kent-Owens Machine Co., Booth 1218.

For more data circle No. 87 on postcard, p. 249.

Double-action press

Exceptionally high speed production is obtainable with a double-action hydraulic press originally designed for auto parts manufacturing. The 18½-ft high press is a compact, self-contained unit which combines a 150-ton clamp slide with a 150-ton draw ram. This double action is implemented by a 75-ton hydropneumatic cushion assembly used



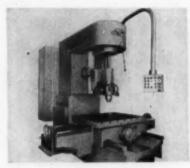
to insure superior deep-drawn parts. It has a 40 by 40-in. bed area, 30-in. draw stroke and 6-in. cushion stroke. It operates at 270 hp with a press approach and return speed of 2000 ipm. Lake Erie Engineering Corp., Booth 1310.

For more data circle No. 88 on postcard, p. 249.

PREVIEW | MACHINE TOOL SHOW CHICAGO

Miller for large work

Workpieces up to 36 in. by 48 in. and weighing as much as 5000 lb, can be easily drilled, bored or vertical milled on an Electromill. All controls are located in a single panel that can be moved easily to



any convenient position, thus providing ease of operation and complete control of the table and spindle at all times. The direct drives give smoothness of operation. Variable speed motors provide a complete range of infinitely variable speeds and feeds. With 35-in. throat capacity, one setting will complete most work. W. B. Knight Machinery Co., Booth 418.

For more data circle No. 89 on postcard, p. 249.

High-speed broacher

A 120-in. new horizontal-type continuous broaching machine, through improved design and application of automation features, substantially increases automotive connecting rod



production. At top speed, it can broach 1800 pieces per hour. Individual self-operating, self-locating fixtures are so arranged that the operator merely sets the parts in the work nest. The Lapointe Machine Tool Co., Booth 707.

For more data circle No. 90 on postcard, p. 249.

Turn to Page 251

You'll see Federal Automation Gages operating on many machine tools at the Show*. Don't miss these latest developments in automatic dimensional control.

Since we manufacture Gaging Equipment only, and the Show is restricted to Machine Tool Builders, we will not have a booth of our own at the Show.



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New Technical Literature

Catalogs and Bulletins

Thermocouple wires

Ceramo thermocouple wires and thermocouple extension wires are described in a 4-page bulletin. This ceramic insulated, metal clad wire is manufactured in all standard thermocouple materials, in several gages and outside diameters, and in different types of seamless metal tubing over-all. All are made to standard ISA calibration accuracies. Thermo Electric Co., Inc. For free copy circle No. 1 on postcard, p. 249.

Hand riveter

A new bulletin covering the unique rotating impact spinner - riveter hand gun and other models of the all - pneumatic Airflex portable series is available. The bulletin illustrates and describes each of the five models along with general features of the SP series construction. The Lemert Engineering Co.,

For free copy circle No. 2 on postcard, p. 249.

Impregnating varnish

A new type of silicone impregnating varnish possessing greatly improved physical properties at temperatures up to 250° is available. Designated SR-60 silicone varnish. the new resin is used for impregnating and bonding electrical equipment such as stator and armature coils, aircraft generators, dry-type transformers, and glass asbestos served wire. General Electric Co. For free copy circle No. 3 on postcard, p. 249.

Wire cloth

A new 15-page catalog is available which lists various kinds of industrial wire cloth in rolls and fabricated parts. Wire cloth is defined, described and illustrated. It includes fabrication services, types of weaves, over 19 varieties of metals used, weights, market grades, wire gauges and many tables and charts of mesh sizes. The Pequot Wire Cloth Co.

For free copy circle No. 4 on postcard, g. 249.



Dial indicators

An 80-page catalog describes and illustrates dial indicators, dial gages and instruments. It includes 140 models of the new high precision - low friction dial indicators, dial test indicators, new magnetic base dial indicator holders, etc. The L. S. Starrett Co.

For free copy circle No. 5 on postcard, p. 249. Corrosion inhibitor paper

A new folder tells how industry is using Ferro-Pak Volatile Corrosion Inhibitor Paper to cut packaging costs, reduce maintenance overhead and improve plant cleanliness and safety by eliminating grease and oil slushing. Cromwell

For free copy circle No. 6 on postcard, p. 249.

Cam feed units

A new line of cam units up to 5 hp capacity, furnished in four sizes, to drill, ream, tap, and mill is available. Each unit is self-contained. Data sheets on each or all units are available. Zagar Tool, Inc. For free capy circle No. 7 on postcard, p. 249.

Ball lock punches

Completely described in a folder. ABC ball lock punches are available with different ball sizes for regular, heavy duty, and extra heavy duty services. Also, a new exclusive finishing process for these punches is described in the folder. Accurate Bushing Co.

For free copy circle No. 8 on postcard, p. 249.

FREE TECHNICAL LITERATURE

Sound in industry

Key functions of industrial sound systems are described in a 12-page booklet. Applications of sound and typical equipments are briefly discussed and amply illustrated. It tells how sound can be used to simplify plant administration; coordinate production; improve employee morale; provide effective voice control of all plant functions, and save valuable manpower. Radio Corp. of America.

For free copy circle No. 9 on postcard, p. 249.

Shell molding machines

A leaflet describes the new shell molding machines as to their high output, low initial cost, low maintenance, and proven rugged design for long trouble-free continuous production of high quality castings. It includes dimensions. Shalco Engineering Corp.

For free copy circle No. 10 on postcard, p. 249.

Slitting lines

Multiple rotary slitters, uncoilers, recoilers, scrap choppers and coil cars are featured in a new 76-page book. It also contains information on basic considerations in the choice and operation of slitting lines; analysis of the slitting cycle with time studies for different speeds, coil sizes and weights, etc. The Yoder Co.

For free copy circle No. 11 on postcard, p. 249.

JackStacker

A new JackStacker with a rotating clamp for inverting skid loads of paper has been announced. In the printing process, the paper can be printed on only one side at a time, so it is necessary to invert the paper for its rerun through the press. With this new JackStacker, this is unnecessary. Lewis-Shepard Products, Inc.

For free copy circle No. 12 on postcard, p. 249.

Pacemaker lathe

A new size lathe, the 32 in. style "H," has been added to this company's line of lathes. This new size has been added to bridge the gap between the 25 and 32 in. heavy duty sizes. The American Tool Works Co.

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FREE TECHNICAL LITERATURE

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This section starts on page 246

Automatic screw machines

Technical data and tooling information on the production of aluminum parts on automatic screw machines is described in detail in a 52-page book just published. Specific information is given on the various types of automatic screw machines, machining speeds and feeds and cutting fluids. It includes drawings, illustrations, and tables. Kaiser Aluminum & Chemical Sales, Inc.

For free copy circle No. 14 on postcard.

Nuts and bolts

Catalog No. 54 is the company's latest material on their line of stainless steel and nonferrous metal bolts, nuts, cap screws and washers. It gives information on the various types in each of these categories and includes list prices. Pawtucket Manufacturing Co.

For free copy circle No. 15 on postcard.

Steel bars

A new 52-page booklet is divided into two parts: cold finished carbon steel bars and cold finished alloy steel bars. It contains many tables and data charts for the most complete information on steel bars. Keystone Drawn Steel Co.

For free copy circle No. 16 on postcard.

Construction crane

The many advantages of this Jones construction crane are given in an illustrated folder. Topics covered include: radii in meters from center of rotation, capacities, and specifications. George Cohen, Sons & Co. Ltd.

For free copy circle No. 17 on postcard.

Heat treating

A practical guide to assist those planning new, enlarged or redesigned heat treating departments is available. The 24-page booklet describes how to select furnaces of the right size, shows recommended layouts, and gives approximate floor space requirements. Auxiliary equipment such as hardness testers is listed. Furnace Div., Lindberg Engineering Co.

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Immersion heater

Steel sheath heater for alkali cleaning solutions, vapor solvent baths, etc., and copper sheath heaters for water are described in a leaflet. It contains illustrations, advantages, uses, construction and installation. Pyrosil, Inc.

For free copy circle No. 19 on postcard.

Electric generators

A new bulletin describes electric generators as to: convenience and unexcelled accuracy, dependable operation and long life, standard and optional features that give more for the money, generator controls to meet every electrical application, etc. The Ready-Power Co.

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Transmission towers

Transmission towers are described in a new bulletin now available. Body and leg extensions to both double and single circuit towers, in order to obtain desired height and meet uneven ground conditions, are included in the bulletin. Blav-Knox Co.

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Sling chains

A new catalog incorporates on single pages all the necessary information for ordering each type of sling. One page is devoted to each type, and on each page complete information can be found as to specifications, illustrations and working load limits for all three grades—Cam-alloy, high test steel and wrought iron. Campbell Chain Co.

For free copy circle No. 22 on postcard.

Chiptrol tooling

A new 6-page bulletin contains full information on the 6 sizes and 11 styles now available of Viking dexamatic "chiptrol" tooling for both light and medium duty machining applications with triangular and square throw-away carbide inserts. These throw-away insert tools offer an exclusive feature of negative as well as positive rake angles. Viking Tool Co.

For free copy circle No. 23 on postcard,

Corrosion control

An illustrated book describes the many ways zinc lengthens the life of steel products, and reduces maintenance costs. Drawings, charts, and photographs together with brief comments present the corrosion control characteristics of zinc coatings, zinc pigments, and zinc anodes. An extensive selection of farm, industrial, marine and building applications of zinc is reviewed. American Zinc Institute, Inc.

For free copy circle No. 24 on postcard.

Roof ventilators

Dimensions, specifications, and performance data on the complete line of Hartzell roof ventilators are now available in a new catalog. This 12-page illustrated catalog carries information and pictures on two new Hartzell models, the Vertijet, an efficient low priced roof ventilator, and a Stack Cap designed for simple, economical duct exhaust sytems. The Hartzell Propeller Fan Co.

For free capy circle No. 25 on posteard.

Mechanical presses

A new line of inverted mechanical presses for a wide variety of spot and projection welding operations is described in a bulletin which illustrates with cutaway views the design features of the presses which have a compact, self-contained mechanical knee unit that facilitates the welding of deep drawn parts or assemblies where adequate clearance for loading and unloading is required. Expert Welding Machine Co., Div. Expert Die & Tool Co., Inc.

For free copy circle No. 26 on postcard.

Tool steels

A newly-revised 44-page book entitled "Tool Steels for the Non-Metallurgist" is available. It is intended to familiarize the non-metallurgist with the 6 basic classifications of tool steels, enabling him to better handle the numerous grades within the general classifications. Crucible Steel Co. of America.

For free copy circle No. 27 on postcard.

Hemco-Motive

New literature, which describes important changes in the company's new model Hemco-Motive, is available. The Hemco-Motive is a roadable type rail car switcher which utilizes the box cars' weight, through weight transfer, to obtain traction. This machine is now equipped with a coupler that gives positive connection between the Hemco-Motive and the rail car. Hemco Manufacturing Inc.

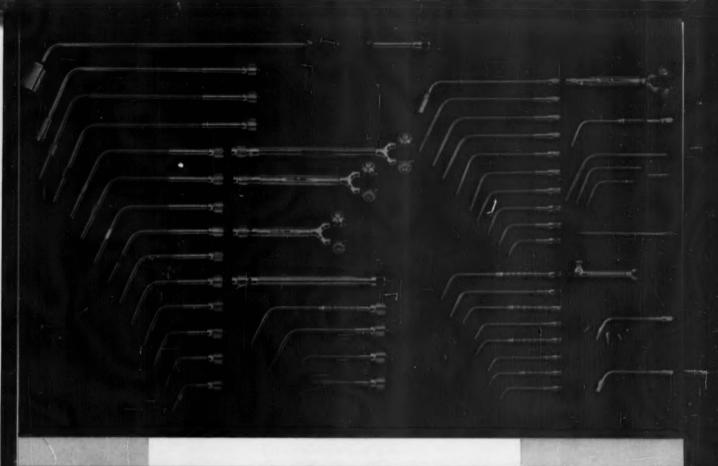
For free copy circle No. 28 on postcard.

Weight-rate-profit chart

Truck operators now can actually compute the profit available through the use of aluminum trailers, bodies and wheels by consulting the new "weight-rate-profit" chart just published. The valuable chart was formulated by Alcoa development engineers from the actual operating records of leading aluminum truck operators and owners. Aluminum Co. of America.

For free copy circle No. 46 on postcard.

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Accurate threads of excellent finish are produced by a chipless cold forming process, using a recently developed thread rolling machine. It features a two-roll cylindrical thread die design with the work blank supported in position between the rolls on a workrest blade. With suitable rolls, the machine can pro-

duce threads of all type from 3/16 to 3 in. diam, except square threads or threads of high taper. It can make threads by four distinct rolling methods as required by workpiece design or material hardness. It is driven by a 7½ hp motor. Landis Machine Co., Booth 1406. For more data circle No. 91 on postcard, p. 249.



Automated grinder

Four diameters on automotive universal joint spiders are finish ground on a new centerless grinder which includes special automation features. For high production, the machine is equipped with an automatic hydraulically operated work



loader with a magazine-type feed and an indexing unit for turning the workpieces. Multiple wheels are mounted on the grinding wheel spindle as well as the regulating wheel spindle. Tolerances are held to 0.001 in. on the 240 pieces it produces per hour. Landis Tool Co., Booth 1117. For more data circle No. 92 on postcard, p. 249.

New rapid borer

A new rapid borer is claimed to bore, trepan or counterbore from three to eight times faster than by the conventional D-bit method. It



will bore 1½-in. holes in solid type 303 stainless at more than 7 ipm. It gives excellent accuracy and finish. Cutting oil is forced between the boring bar and hole wall, forming a continuous bearing. The R. K. Le-Blond Machine Tool Co., Booth 1313.

For more data circle No. 33 on postered, p. 243.

Now!

3 times the cutting life—
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A revolutionary process, patented by the world's largest maker of electrical and grinding tools, has been adapted for precision toolmaking by Permattach.

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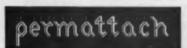
Maximum tool life . . . only first-run stones are used, the whole diamond is used up. No product damage from loose or dislodged stones . . . no tool failures from vibration, heat, pressure. Close tolerance maintained throughout operations . . . intimate bond gives uniform frictional heat transfer. Plus . . .

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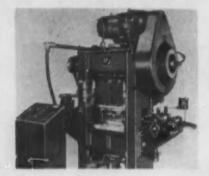


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Double-crank press uses progressive die

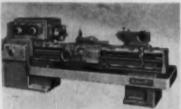
This 20-ton capacity double-crank, straight-side press operates with a progressive die for high-speed volume production of small precision parts. Its standard stroke length is 1 in. and it has a maximum speed of 450 strokes per minute. The press includes an air clutch with controls for inching, single stroke and con-

tinuous running, adjustable rotary limit switch, air release spring set brake, flood oil lubrication system with pressure controlled switch, thermal limit switches in all crankshaft bearings, plus many other features. L & J Press Corp., Booth 407.

For more data circle No. 94 on postcard, p. 249.

New lathe

A computing head on a lathe which is said to be "new from headstock to tailstock" merely requires setting of two dials and the correct settings for the three-speed shift-



ing levers are instantly indicated. All control handles have been regrouped for convenience and shaped for fumble-free operation. A built-in ammeter indicates the amount of lathe capacity being expended. Lodge & Shipley Co., Booth 502.

For more data circle No. 95 on posterrd, p. 249.

Blank to finished gear

Called a Gear-O-Mation unit, a universal ultra-speed hobber equipped with automatic loading is the first step in an automatic gear production line. After hobbing, the gear goes through a washer to remove any clinging chips, then through a



3-way classifier. Also of interest is that the helix angle of gear teeth is set by a simple vernier scale adjustment. Lead change gears are not required. Michigan Tool Co., Booth 1220.

For more data circle No. 96 on postcard, p. 249.

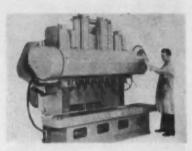


Straight-line driller affords easy operation

This straight-line drilling machine, with hydraulic rail feed and eight spindles, incorporates the latest improvements for ease of operation and flexibility. Spindle speeds, for example, can be changed easily and quickly by means of a four-speed, quick-change gear box. Capacity of

each spindle is a V_8 -in. diam drill in mild steel. Smaller and larger spindle units are applicable to this machine. Maximum center distance between end spindles is 6 ft. Moline Tool Co., Booth 1304.

For more data circle No. 97 on postcard, p. 249.



Multicycle programming

A four-cut, fully automatic work cycle, higher turning speeds and greater cutting capacity are obtained with a new Mona-Matic lathe, developed for quantity production of a given workpiece. An



electric multicycle programming control makes the lathe simple to operate. Once the workpiece is positioned and the start button engaged, the lathe completes its cuts automatically. The Monarch Machine Tool Co., Booth 920.

For more data circle No. 28 on postcard, p. 249.

Circular saw

The latest improvements and innovations have been built into a circular sawing machine capable of cutting machinable metals up to 8 in.



round or square—solid or structural shaped. All control mechanisms are at the front of the machine. Six spindle speeds reduce set-up time and increase speed. Motch & Merryweather Machinery Co., Booth 606.

For more data circle No. 99 on postered, p. 249.



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IN CANADA: COLONIAL TOOL CO., LTD.



Heavy-duty hobber meets needs for high output

A single-spindle, heavy-duty gear hobbing machine is a completely new model from the floor up, designed specifically to meet the problems of high-speed hobbing. This machine is equipped with not only self-loading and unloading, but also by means of a checker and a feed back, adjust the machine for pitch diameter control and signal the ma-

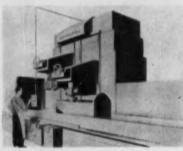
chine for shifting the hob. The machine is also made in four- and six-spindle rotaries. In addition, it has a chip clean-out chute, heavy headstock, large column, new hob head for spindle speeds up to 1000 rpm and a 3-in. readily controlled hob shift. The Lees-Bradner Co., Booth 701.

For more data circle No. 100 on postcard, p. 249.



Combination grinder

A combination way and surface grinder, featuring independent vertical and horizontal spindle slides, will solve specific problems faced by machine tool builders. Grinding of large bed castings, columns, tables,



slides, saddles and heads to precision tolerances can be done with this one machine without costly and time-consuming rehandling. It can grind "V" and flat ways, dovetails, shoulders, edges, radii and contours—all with the same setup. More important—two or more surfaces can be held in exact relative alignment. Mattison Machine Works, Booth 1422.

For more data circle No. 101 on postcard, p. 249.

Drilling machine

An entirely new system of locating and drilling holes has been incorporated in a drilling machine which uses no jigs or fixtures and does not require laying out of individual workpieces. It is particularly suitable for producing experimental parts, replacement parts, small quantities of duplicate pieces or even production quantities which would otherwise tie up a jig borer or other expensive machine. It will do drilling to depth or through,



NEW USS "T-1" STEEL has great potential for reducing cost of pressure vessels

You've heard of Operation "T-1." You've heard how those dramatic tests proved that, when and if higher design stresses are permitted, USS "T-1" constructional alloy plate steel will make possible larger, stronger pressure vessels, vessels that can be built more easily and at lower over-all cost. As a result of Operation "T-1," several major pressure vessel fabricators have requested approval from the ASME to use USS "T-1" Steel in unfired pressure vessels. Why? For mighty good reasons:

"T-1" Steel has a very high yield strength — 90,000 psi minimum — three times that of conventional plate steels now used in pressure vessels. Yet it is extremely tough and can withstand high stresses and pressures even at temperatures far below zero. What's more, USS "T-1" Steel remains strong at high temperatures up as high as 900 degrees F.

Yet, "T-1" Steel is easy to fabricate. It can be drilled, machined, or cold formed, and welded or flame-cut without pre- or post-heating. "T-1" can make pressure vessels...

LARGER. For a given pressure and shell thickness, the radius of a vessel may be increased in direct proportion to the ratio of working stresses. Result: more storage capacity at lower cost.

STRONGER. For a given radius and shell thickness, the *pressure* may be increased in proportion to the ratio of working stresses. Result: vessels for higher pressures at lower cost.

LIGHTER, EASIER TO BUILD. For a given pressure and radius, the shell thicknesses may be reduced, thus permitting larger vessels to be fabricated without stress relief. Result: lower fabrication cost.

United Sta	 		30	Ber.
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States Steel presents T-1" which contains the full story of "T-1" steel.

Have your representative get in touch

with me.

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Address

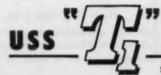
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State..

UNITED STATES STEEL CORPORATION, PITTSBURGN . COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO.

TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. . UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK



CONSTRUCTIONAL ALLOY STEEL

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A chip solvage system, with an American Metal Turnir-is Crusher at the core, can help you realize new savings and profits in metal, oil, man-hours, factory space, and tool maintenance. Consider these typical maney-saving, money-making advantages of an American installation:

- (1) Brings \$3 to \$4 more per ton for chips than for long machine shop turnings.
- (2) Reclaims 30 to 50 gallons of cutting oil per ton.
- (3) Prelongs tool life through more liberal use of recovered oil.
- (4) Saves 75% storage space . . . permits heavier freight car loads . . . cuts shipping costs.
- (5) Easier, faster handling.
- (6) Easier briquetting, so essential for foundry and steel mill use.

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

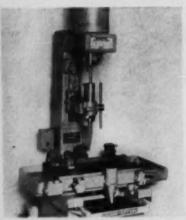
3600 Gallons Cutting Oil Recovery at 30¢ Per Gallon. \$1,080.00 Per Year (30 gallons per ton x 240 tons = 7200 gallons.

Half of this, 3600 gallons, can be credited to use of chips instead of long turnings.)

TOTAL GROSS PROFIT
[Resulting from an American Installation]\$2,340.00 Per Year

WRITE for American Rolling Ring Motal Turnings Crusher Bullotin.





reaming, spot facing, counterboring, countersinking and other drilling operations. It has a movable work table equipped with dual locks which are released by pushbutton operated solenoids. An optical viewer having 20:1 magnification and double cross hairs is mounted at the forward edge of the table for locating holes from a layout chart. Leland-Gifford Co., Booth 321.

For more data circle No. 102 on postcard, p. 249.

Automatic honer

A new method of processing pinion gears so that they give longer life and quieter operation with increased production and less scrap has been incorporated into the design of an automatic flat honing



machine. Gear blanks first pass through this machine which generates the two end faces of the gear parallel and flat, thus establishing control surfaces for subsequent processing. Feed-back compensates for abrasive wear. Micromatic Hone Corp., Booth 1211.

For more data circle No. 163 on postcard, p. 249.

New 110-ton gap press

A new approach in design has been taken to achieve minimum deflection by the use of steel "C" frame

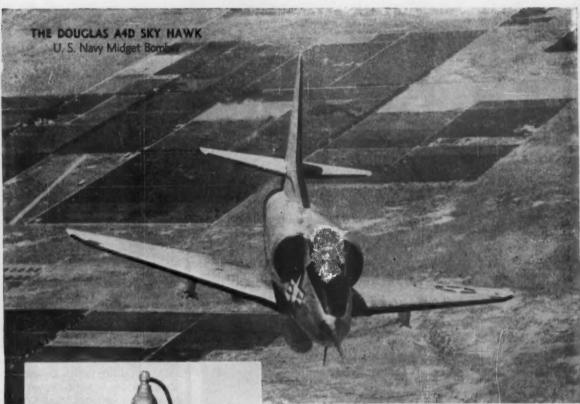


Photo courtesy Douglas Aircraft Company, El Segundo, California

LEE Grinders at Douglas Aircraft

K. O. Lee Grinders at the El Segundo Division of Douglas Aircraft Company, have the job of maintaining the accuracy of standard tools and cutters as well as the many specially designed tools needed to produce fine aircraft.

The Lee Grinders were engineered by practical men who have perfected a tool grinder that will cut your set-up time in half! That's why so many tool room men insist on Lee.

Fixtures available for external and internal grinding, tap grinding, radius grinding, make the Lee tool grinders so versatile it's no wonder users call them "the busiest machines in the shop."

Write today for complete literature and the name of our nearest distributor.

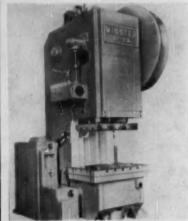
K. O. LEE CO., ABERDEEN, S. D. UNIVERSAL TOOL GRINDERS - CHIP BREAKER GRINDERS CARBIDE TOOL GRINDER PIXTURES REYLESS CHUCKS - MANDRELS - HAND GRINDER SETS

Illustration shows model BA860 Universal Grinder with the new Model B943 Motor Driven Work Head. With this work head, I.D., O.D., and face grinding can be accomplished with a single chucking. Write for complete literature.

VISIT OUR BOOTH NO. 554 AT THE METALWORKING MACHINERY AND EQUIPMENT EXPOSITION, CHICAGO COLISEUM, SEPTEMBER 6-17, 1955



construction in a 110-ton singlegeared type gap press. The singlepoint press is equipped with electric motorized power inclining. The cabinet legs fully enclose the electrical,



air and lubrication systems. Continuous recirculation of oil is provided by the lubrication system. Another feature is the patented combination air operated friction clutch and brake which is mounted within the main drive gear. Getting the press ready for operation is a relatively simple matter. The operation merely snaps on a single air line, then plugs in the power line and the press is ready to run. A heavier duty press in the same series has a capacity up to 150 tons. Minster Machine Co., Booth 1410.

For more data circle No. 104 on postcard, p. 249.

Cutting fluids

With the many new and tough alloys, cutting fluids play an increasingly important role in reducing friction, improving work quality, reducing wear on tools, preventing rust and dissipating heat. The present trend in accomplishing all these benefits is toward greater use of water-soluble compounds. In this case, such a com-



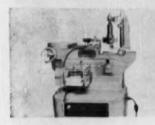
PREVIEW | MACHINE TOOL SHOW CHICAGO

pound keeps spindles, tools and work cool in an automatic operation. It's an all-purpose base in a ratio of 1:25 with water. E. F. Houghton & Co., Booth 318.

For more data circle No. 105 on postcard, p. 249.

Gear comparator

A new comparator automatically checks tooth-to-tooth spacing around a gear or similar part. The gear can be checked while it is in

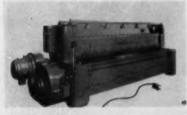


motion. By combining this action with recording, the machine reveals an accurate spacing picture. The chart makes it possible to analyze and interpret the accumulated spacing and maximum out-of-position in errors of the teeth. Several other checks can be made using standard and special fingers. Illinois Tool Works, Booth 1323.

For more data circle No. 106 on postcard, p. 249.

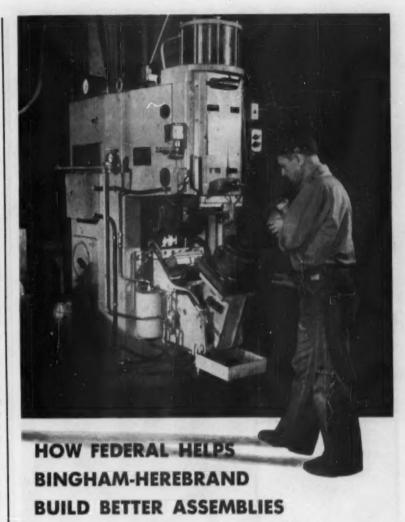
Inclinable press

Spearheaded by a brand new line, the front-to-back crankshaft inclinable press, and engineering advances in modern press automation, the Niagara exhibit-in-action will



show latest developments in straight side eccentric geared presses, straight side double crank presses, power squaring shears, single and double crank open back inclinable presses, press brakes and bending rolls. Niagara Machine & Tool Works., Booth 715.

For more data circle No. 107 on postcard, p. 249.



Bingham-Herebrand, Toledo, O., is one of the nation's foremost suppliers of fabricated parts and assemblies for the automotive and appliance industries. To maintain constant high quality, yet keep their prices competitive they must continually work at controlling their costs.

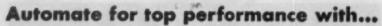
It's this cost consciousness that has brought them to rely on Federal Resistance Welders. Their records show they get more production at less cost from Federal equipment.

Bingham-Herebrand is not alone in this respect... for wherever resistance welding units are a major operation and costs are important, you'll find machines by Federal — First in Resistance Welding.



Warco

THE FEDERAL MACHINE AND WELDER CO.





- The Only Cylinders with all the Extres as Standard
- e OIL pressure to 750-AIR to 200 P.S.I.
- New Compact Design . . . Saves up to 40% Space
- Preven Parformance . . . with Extra High Safety Factor
- Super Cushian Flexible Seals for Air . . . New Self-Aligning
 Master Oil Cushian
- @ Hard Chrome Plated Bodies and Piston Rads (Standard)
- Only from T-J can you got these new ingenious cushion designs

More and more of industry's automation problems today—solved with T-J Spacemaker Cylinders! New compact design and many more plus features for a new high in efficient cylinder performance and dependability. Wide range of styles, capacities ... to help you save labor, reduce costs on all kinds of push-pull-lift jobs. Send for bulletin SM-155-1. The Tomkins-Johnson Co., Jackson, Mich.



Member of the National Fluid Power Association

New 8-spindle automatic

The 4 in. Acme-Gridley 8-spindle bar automatic will be shown for the first time. Using carbide tooling throughout, bearing races will be produced two-at-a-time in a machine cycle time of 21 seconds—340



pieces per hour. Standard spindle speed range of the machine is 56 to 464 rpm. The 1½ in. 8-spindle model will produce a spark plug body from B-1133 steel hex stock, performing 16 operations in 4.5 seconds machine cycle time (800 per hour gross production) using carbide and high speed steel tools. The National Acme Co. Booths 705 and 324.

For more data circle No. 108 on postcard, p. 249.

Working transfer model

An outstanding example of automation in miniature at the Machine Tool Show will be the 1/12 scale working model of a 120-ft Natco Holeway machine. The model is fully automatic and simulates every



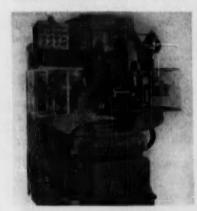
action of its actual size counterpart which is now installed at an automotive plant and is machining about 160 cylinder heads per hour. The model permits the observer to follow the complex operational sequence of a Natco Holeway machine (60 operations in all) within a distance of ten feet. National Automatic Tool Co., Inc. Booth 1123.

For more data circle No. 169 on postcard, p. 249.

PREVIEW | MACHINE TOOL SHOW CHICAGO

Gear shaver

A complete gear shaving and inspection department in full operation handling a wide variety of internal and external gears will be set up by the National Broach & Machine Co. Included in the department will be the latest models of external and internal gear shaving



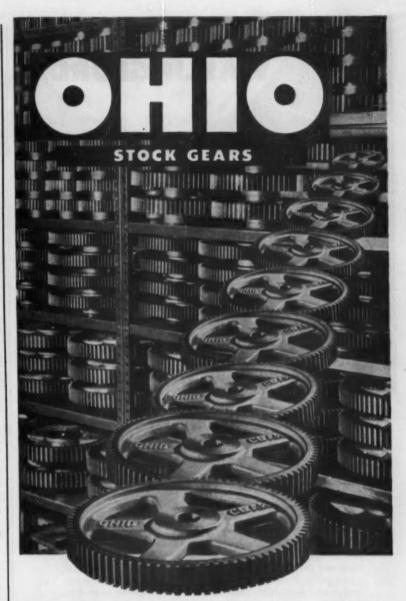
machines, automatic loading devices, gear speeders, gear nick testers, gear checkers, gear rolling fixtures, automatic gear gaging and sorting machines and air-powered broaching fixtures. Among the new machines will be the Red Ring Model GCU-12 in. external gear shaving machine equipped with an automatic loader and having an automatic differential upfeed mechanism. This machine will be shaving an automotive transmission cluster helical gear. All shaving machines will be equipped with transparent guards. National Broach & Machine Co., Booth 1215.

For more data circle No. 110 on postcard, p. 249.

Automated grinder



The automatic transfer type crankpin grinder will be one of six machines exhibited by the Norton Co. The machine is designed to pick up



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For Faster Deliveries — Greater Values . . . join the hundreds of nationally known firms whose engineers have proved the value of Ohio Stock Gears.

Ohio Gears are not limited to a few widely used types and diametrical pitches, but are designed to form a complete line of spur, bevel, helical, worm, and worm gears — to meet the widest variety of power transmission requirements.

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crankshafts from a conveyor, grind each crankpin and place the finished shaft on a second conveyor at the rate of one shaft per minute. The machine has already been installed in two American and one European automotive plants. Other machines on display will include a multiwheel grinder, universal grinder type U-4, semiautomatic wheel slide grinder type CV-4, cylindrical grinder type CTU and the No. 3 Cam-O-Matic cam grinder shown here. Norton Co., Booth 516.

For more data circle No. 111 on postcard, p. 249.

Squaring shear

Including the very latest in design features, this power squaring shear provides metalworking shops with safe, efficient, accurate and



trouble-free operation. It has a capacity of \(^1\)4-in, thick mild steel and can make cuts up to 10 feet in length. This model is equipped with a power-operated back gage, a pneumatic tripping device to operate the clutch and safety guards of special design. Wysong and Miles Co., Booth 913.

For more data circle No. 112 on postcard, p. 249.

Model transfer machine

A transfer machine for automotive engine rocker arm shafts featuring fully-segmented automation will be illustrated in model form at the show. The 8-station, 53-ft



long machine, although extremely compact and efficient, is actually made up of a series of six individual machines; each having individual controls. Snyder Tool & Engineering Co., Booth 1222.

For more data circle No. 113 on pesteard, p. 249.

It pays to judge

JESSOP by the

customers it keeps

Jessop Steel Company, in case you didn't know, is an integrated producer of tool, die, high-speed and stainless steels. It isn't the largest company in the business (yet) but it is growing fast and is certainly the most diversified.

Lost year, with business slightly depressed within the specialty steel industry, Jessop kept its old customers and gained new ones until it attained the largest customer list it has enjoyed at any time in its long history.

Now, this year, with the customer list still expanding and all the new and old customers buying in greater volume, Jessop is shipping more steel than ever before, and has been forced to greatly enlarge its facilities to take care of the business.

The moral of the story is this: If all these new people are bringing all this new business to Jessop they must have a reason for it... and the reason must be good quality and good service, because those are the things that get new customers and keep them when competition is keen. Why not climb on the band wagon and become a Jessop customer yourself? You'll be glad you did.

STAINLESS STEELS * RIGH SPEED STEELS * NOR-MAGNETIC STEELS HIGH SPEED TOOL BITS * HEAT RESISTING STEELS * STAINLESS-CLAD PLATES * CARBON AND ALLOY STEELS * TOOL STEELS FOR SPECIAL PUPPOSES * CAST-TO-SHAPP TOOL STEELS * NIGH SPEED AND ALLOY SAW STEELS * PEMPIRED AND GROUND STEEL * COMPOSITE RIGH SPEED STEELS * STAINLESS AND MEAT RESISTING CASTINGS * COMPOSITE DIE STEEL SECTIOMS * PRECISION GROUND CASTINGS * COMPOSITE DIE STEEL SECTIOMS * PRECISION GROUND

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OFFICES IN PRINCIPAL CITIES

Jessop Steel of Canada Limited, Wallaceburg, Toronto

Jessop Steel International Corp., Chrysler Building, New York, New York

What it takes to make a 3000 Degree Refractory Concrete



Because of the widespread interest in the use of refractory castables, many furnace operators have asked us for the story behind the performance of B&W's unique refractory concrete, Kaocast.

Here are the answers to some of the most frequently asked questions:

- Q. When you refer to Kaocast as a 3000 degree refractory castable, do you mean that its melting point is 3000° F?
- A. No, this means that its service use limit is 3000° F; its melting point is 200 degrees higher.
- Q. Just what does it take to make a 3000 degree refractory castable like B&W Kaocast?
- A. Let's first define a few terms. Refractory castables are made with granular materials which are volume stable at high temperatures and which can undergo repeated heating and cooling cycles without disintegration. These materials, known as refractory calcines or grogs, are blended with suitable hydraulic binders. The initial strength of a refractory castable is thus developed in the same manner as that of ordinary concrete—that is, through the chemical action between water

and the binder. A strong *ceramic bond* is formed when the refractory castable is subjected to temperatures above the vitrification point.

- Q. Then you have a grog, a binder and a method of putting them together. Which is most important?
- A. You can't say that any one is most important. It's a combination of all three. Let's take them one at a time. Our grog consists primarily of the proper blend of kaolin and other alumina-silica materials. This ratio enables us to achieve a grog with minimum expansion and shrinkage, a high fusion point, and greater stability under load, at varying temperatures.
- Q. And now, what about the binder?
- A. There are a number of factors responsible for the success of the Kaocast binder. One is the compound Tricalcium Penta-aluminate (3 lime to 5 alumina). This formula produces the most refractory compound (highest melting point) that can be made from lime and alumina. Another is that by using the purest commercially available lime and alumina, the Kaocast binder is substantially free of iron and silica. Such traces of these that are present combine during the pre-

firing of the binder to produce stable compounds.

- Q. Just how important is the manufacturing or "blending" of the grog and the binder?
- A. If one factor could be singled out as "most important" it would be quality control.

Direct control over the fineness of materials, prefiring temperatures, and other phases of manufacture is possible at B&W because both the grog and the binder are made and blended at B&W's Augusta Works—under B&W's direct control and supervision.

- Q. These factors you've discussed must add up to some specific advantages of Kaocast. What are they?
- A. B&W Kaocast has all the advantages of easy installation which are responsible for the widespread interest in refractory concretes, plus these exclusive features: It is the only 3000 degree refractory concrete with high resistance to spalling and low volume change throughout its operating range.

THE BABCOCK & WILCOX CO.

Refractories Division General Offices:

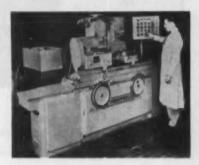
161 East 42nd St., New York 17, N. Y. Works: Augusta, Ga.

Grinder features automatic wheel dressing

Designed especially for the Crushture dressing process, the new Sheffield Model 180 multi - form grinder, uses a 4-in. wide wheel, will grind work up to 10 in. diam and will accommodate a 24-in. long workpiece. It is available with built-in size controls for automatically bringing parts to finish size. The machine features an au-

tomatic wheel dressing device, variable speed control for automatic fast and slow feed of the wheel into the work, and an automatic plunge wheel device with a 1-in. rapid approach and retraction of the wheel to the work. The Sheffleid Corp., Booth 1305.

For more data circle No. 114 on postcard, p. 249.



Punch card control

A new single point production lathe at the show will have a punch card controlled programming attachment making it possible to change speeds, feeds, carriage movements and indexing of the tool turret just by changing the punched card. Designed for single point turning of shafts, the machine is equipped with a two-position turret so that rough and semifinish cuts can be taken with a roughing tool and a finish cut with a finishing tool, all in one automatic cycle. Sunstrand Machine Tool Co., Booth 1412.

For more data circle No. 115 on postcard, p. 249.

Lubrication service

As in 1947, Sun Oil Co. will again have product storage space at the show. It will be prepared to supply exhibitors with cutting oils, lubricating oils, hydraulic oils, greases and solvents. The company will also have available the services of trained lubrication specialists. The firm will be equipped to transport products from their storage area direct to exhibitor's booths, and fill and drain equipment on request. Sun Oil Co., Booth 112.

For more data circle No. 116 on postcard. p. 249.

MORE TO COME

Additional information on new and improved equipment and methods to be exhibited at the Machine Tool Show will be included in the Sept. 15 issue of The Iron Age.



GALLMEYER & LIVINGSTON COMPANY 400 Straight Ave., S.W., Grand Rapids, Mich.

PREVIEW

PRODUCTION ENGINEERING SHOW

Described and pictured here are many new and advanced designs of metalworking equipment to be exhibited at the Production Engineering Show, Navy Pier, Chicago. Show hours will be 1:00 to 10:00 P.M. daily from Sept. 6 to 17 inclusive, except Sunday, Sept. 11.



Borescope magnifies internal surfaces

This 50 power, right angle instrument is intended for inspecting plane surfaces and the internal surfaces of cylinders whose diameters are 4.5 in. or larger. One application is inspecting the porosity of chrome on internal surfaces which have been chrome plated and honed. The device is made in working lengths of 16, 24, or 31 in. A 6-v lamp provides the illumination. American Cystoscope Makers, Inc., Booth 533.

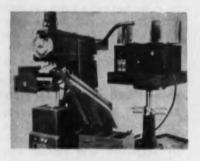
For more data circle No. 117 on postcard, p. 249.

Hopper feeds fully automatic hardness tester

A fully automatic Rockwell hardness tester is capable of testing the hardness of ferrous and nonferrous metals at the rate of 1000 to 1200 tests per hour. Parts to be tested are vibrator-fed into the machine and placed in position beneath a diamond penetrator. After

testing, parts are routed into bins labeled "hard," "good," and "soft." Colored lights above the dial show the classification of each part as it is tested. Wilson Mechanical Instrument Div., American Chain & Cable Co., Inc., Booth 116.

For more data circle No. 118 on postcard, p. 249.





Variety of tools for maximum production

Carbide-tipped tools and holders, a universal radius grinding fixture, and double serrated tool bits and holders are major items offered to help your machining schedules. The inserted carbide-tipped tools can be reground, placed in the holder, adjusted to original cutting dimensions, and locked securely in place. This provides long tool life by adjustment. Apex Tool & Cutter Co., Booth 855.

For more data circle No. 119 on postcard, p. 249.

Radio waves guide tractor-trailer system

Neither an operator nor physical connectors are required for this completely automatic tractortrailer materials handling system. The tractor starts, moves and stops according to radio signals emanating from a guide wire strung above its route. A "sniffer" box in the tractor picks up the radio guide waves, and an electronic "brain" answers commands instantly and correctly. Radio routes may vary. Barrett-Cravens Co., Booth 452.

For more data circle No. 120 on postcard, p. 249.

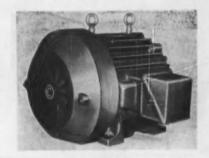


Motor fan is efficient in either direction

To be shown for the first time is this new totally enclosed, fan cooled motor line, with similar construction features used in 71/2 to 100 hp sizes. Motors meet all NEMA requirements and also have (1) 6layer insulation for stator windings: (2) ventilating fans that have the same cooling efficiency in

either direction, and which do not have to be changed: (3) rib type cast iron frames for easy cleaning: (4) electronically balanced rotors. Other new motors and a selective speed unit will also be featured. Century Electric Co., Booth 418.

For more data circle No. 121 on postcard, p. 249.



Pushbutton elements

A new line of oil-tight pushbuttons has been specially designed to save space. The small size permits application to any space with a minimum of trouble and a saving in time when mounting. Greater



flexibility is provided by the new compact contact blocks and indicating lights. These require less rear panel extensions and can be used with a variety of operators. This permits a wide range of applications with a relatively small inventory. Appearance has been made highly attractive. Cutler-Hammer, Inc., Booths 423 & 424.

For more data circle No. 122 on postcard, p. 249.

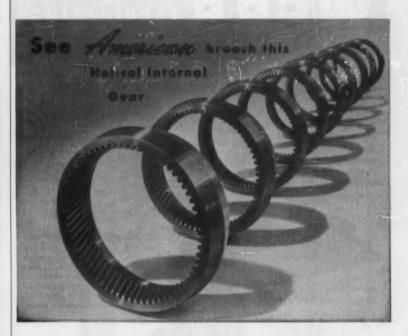
Tool holder

Carbide pads for "throw-away" type carbide cutting inserts are featured in a newly-designed tool holder which is available in 5 basic styles to accommodate all machin-



ing operations. The holders provide extra rigidity. Carboloy Dept., General Electric Co., Booth 665 and others.

For more data circle No. 123 on postcard, p. 249.



AT BOOTH 1412 - MACHINE TOOL SHOW



American broaches the I.D. and 68 internal gear teeth in this 51/2 inch diameter automotive transmission gear . . . does it fast and economically. You are cordially invited to see the machine and tooling in operation, as one of the many outstanding features of the Sundstrand and American Broach section at the show.





Form grinders have automatic feed motions

Form grinding demonstrations will be conducted on new completely automatic grinders which incorporate automatic downfeed as well as automatic crossfeed and crossfeed reverse. Visitors will see how grinding wheels are form-dressed or shaped, and how these forms are subsequently reproduced in the work. A corollary demonstration will deal with slicing and dicing of germanium, a highly brittle material which requires extreme stability in the slicing machine. The DoAll Co., Booth 407.

For more data circle No. 124 on postcard, p. 249.

Set screws

The full line of socket screw products to be displayed will feature the through-broached set screws

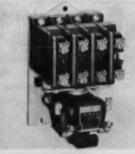


illustrated. These have the socket extending all the way through so that they can be wrenched from either end with equal ease; an aid to hopper-fed power screwdrivers. The Bristol Co., Booth 640.

For more data circle No. 125 on postcard, p. 249.

Machine and press relays

The type PM relay is a completely new design for heavy duty machine tool, press and similar control devices. It occupies minimum panel space without reducing life or capacity, crowding wiring, or making maintenance difficult. It features a modular design with each



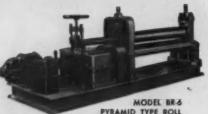
pole, or contact assembly, mounted on a separate detachable melamine block. Individual poles can be readily removed and contacts converted from normally-open to normallyclosed. Up to 8 poles are available without double decking. Clark-Controller Co., Booth 840.

For more data circle No. 126 on postcard, p. 240.

WEBB PLATE FABRICATING MACHINERY

PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



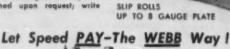


Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's madern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

SLIP ROLLS

A complete line of small Sheet Metal Forming Raits are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special raits for the farming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. E.









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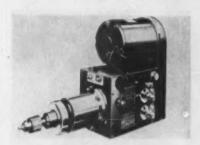
SLIP ROLLS

Automatic drill units mount in many ways

The Series 24 automatic drill unit is self-contained, operates on a very low volume of air, and is designed for either long or short production runs. It requires only conventional shop air and electric power. Primarily a drill unit with conventional chuck attachments, it

can be converted for tapping, reaming, deburring, centering, hollow milling, and other operations. All relays, switches and valves are built in; units can be mounted in any bracket combination. The Dumore Co., Booth 547.

For more data circle No. 127 on postcard, p. 249.



Surface plates

These black granite surface plates are made with two and four clamp ledges. They provide a uniform



surface of extreme accuracy, finished up to 50 millionths of an inch. All are non-rusting and non-warping. Collins Microflat Co., Booth 455.

For more data circle No. 128 on postcard, p. 249.

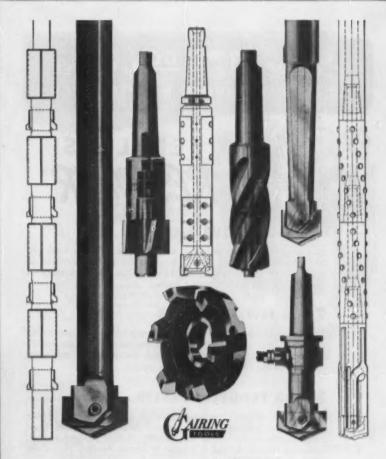
Machine tool crates

Mass-produced, economical and easily-assembled wirebound boxes and crates for machine tools and other heavy products will be featured. New developments that permit driving longer staples into heavy cleats and slats make it unnecessary, in many cases, to resort to the



use of expensive, custom - built shipping crates for heavy equipment items. Crates to be shown for milling machines and comparators are typical of those used for machinery weighing several thousand pounds. They represent user savings in packaging material costs, packing labor costs, and freight shipping charges. General Box Co., Booth 532.

For more data circle No. 129 on postcard, p. 249.



Try them for yourself . . .

- You'll be amazed at the rigid cutting power of the quick-change Block-Type Boring Tools . . . no cross holes or centering pins . . . an exclusive Gairing feature.
- You'll discover the economy of drilling all large holes with Gairing Spade Drills. The holders shown use standard cutters to drill and bore shallow holes as well as holes of great depth.
- You'll find out about savings in grinding costs and tool inventory by using standard Gairing E-Con-O-Mills. And you'll find the well-known Counterbores and Core Drills supreme in quality, moderate in cost.

THE GAIRING TOOL COMPANY

In Canada: A. C. Wiskman (Canada) Ltd., Queensway, Toronto, 14 21224 Hoover Road, Detroit 32, Michigan



Stud welder is compact and precise

This portable stud welding gun can be used in production set ups requiring a high degree of precision and exact stud alignment. It also claims unusual versatility as a cost-saving fastening technique. It is being used on automotive axles and air-conditioner compressor housings. The stud welding gun is light and compact and can easily be carried around from job to job. The NS-9 model is capable of end-welding studs up to 1¼ in. diameter. It is said to operate with drill press precision. Nelson Stud Welding Div., Booth

For more data circle No. 130 on postcard, p. 249.

Save \$175 00 PER WEEK ON THERMOCOUPLE MAINTENANCE



RESTORER.

1 LONGER COUPLE LIFE

A leading metal alloy producer is now saving \$175 per week just on thermocouple replacement. Since installing the Restorer to monitor his thermocouples, he replaces them on an average of once a month instead of once a week.

2 USE FEWER COUPLES

The Restorer's continuing check on thermocouple operation makes the use of extra "insurance" couples unnecessary. One of the world's largest basic steel producers now uses 3 thermocouples, monitored by the Restorer, where he previously used 6.

3 FIND TROUBLES FASTER

Cut the cost of routine manual inspection of thermocouple c'rcuits by using the Restorer to check couples during every cycle. Even minor troubles are corrected and recorded on your pyrometer chart, indicating where to find a couple or circuit needing permanent repair or replacement.

ONE RESTORER CHECKS MANY COUPLES ON HEAT-TREATING AND MELTING FURNACES

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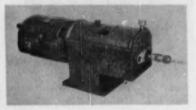


ELECTRONICS DIVISION

THE PEERLESS ELECTRIC COMPANY
FANS . BLOWERS . MOTORS . ELECTRONIC EQUIPMENT
WEST MARKET STREET . WARREN, OHIO

Lead screw tapping unit

This electrically operated, completely self-contained device can be used for single or multiple spindle precision tapping. Instant-acting



electromagnetic clutches for forward and reverse action are controlled by a built-in rheostat. The motor operates continuously in one direction. The head can be set at any angle or position. Ettco Tool Co., Inc., Booth 527.

For more data circle No. 131 on postcard, p. 249.

Filter unit

This P-92 micronic filter can be used either as a low pressure hydraulic filter or in a lubricating oil system. It has a capacity of up to



5 gpm and up to 100 psi operating pressure. High pressure hydraulic filters which are made in both Micronic and metal edge types, will also be displayed. Both of these unit types can handle up to 5000 psi operating pressure and up to 24 gpm capacity. PurOlator Products, Inc., Booth 161.

For more data circle No. 132 on postcard, p. 249.

Lathe sequences are controlled automatically

Among the 6 lathes to be exhibited are several completely new designs for heavy-duty, 24-hour operation. They feature timed operation sequences where "time off," "time on," opening or closing of work-holding fixtures, and selection of spindle speeds can be controlled

either automatically or manually. Also to be displayed are 2-speed, 1-hp lathes for bench or pedestal mounting. Fan-cooled motors permit frequent stops and starts without overheating. The Schauer Mfg. Corp., Booth 245.

For more data circle No. 133 on postcard, p. 249.



Conveyor furnace

Designed to increase production and cut costs, this 13 kw conveyor furnace may be used for brazing, sintering, or bright annealing. Prepared, protective atmospheres may be piped into the gas tight muffle. Work reaches specified, uniform temperature quickly, and then



moves into water-jacketed cooling chambers before discharge. Hevi Duty Electric Co., Booth 252.

For more data circle No. 134 on postcard, p. 249.

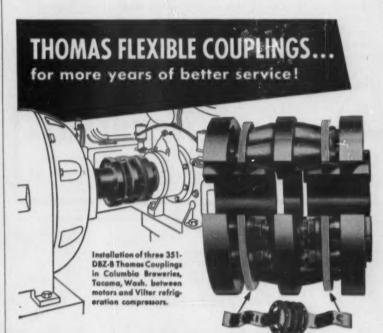
Hydraulic components

This demonstration unit shows how a variety of hydraulic components can be put to work. Among the items shown are double solenoid operated 4-way control



valves connected in series. The hydraulic connecting lines utilize flare-type tube fittings and reusable fittings for the hydraulic hose. The upright cylindrical part at the back of the unit (between two gages) is a new piston-type accumulator. ParkerAppliance Co., Booth 415.

For more data circle No. 125 on peatcard, p. 249.



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCT	TIVE ADVANTAGES	
NO MAINTENANCE	Requires No Attention, Visual Inspection While Operating.	
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.	Thomas Couplings are made for a wide
NO BACKLASH	No Loose Parts. All Parts Solidly Bolled.	range of speeds, horsepower and shaft sizes and can be assembled or
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.	disassembled without disturbing the connected machines, except in rare instances.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling, Elastic Constant Does Not Change, Original Balance is Maintained.	



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THE CINCINNATI GEAR CO. . CINCINNATI 27, OHIO

Centering chuck

A newly developed controlled-centering-pressure chuck will center thin-walled rings and parts at a preset pressure without distorting



them. The 3 universal jaws stop automatically when they come in contact with the workpiece. The 12 independent jaws then move in to pinch the part in its "as is" position. Horton Chuck Div., E. Horton & Sons Co., Booth 836.

For more data circle No. 136 on postcard, p. 219.

Die casting machine

This Model HP-20 die casting machine has a die space of $17\frac{3}{4}$ x $17\frac{3}{4}$ in. between the tie bars and a

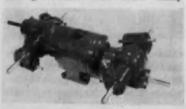


die locking pressure of 400 tons. It is completely hydraulically operated and electrically controlled. It features a patented pressure multiplier unit. Kuz Machine Co., Booths 121 & 122.

Por more data circle No. 137 on postcard, p. 249.

Motor drives 14 shafts

Emphasizing the possibilities of multiple shaft gearmotor applications, this fractional horsepower unit is capable of driving 14 shafts running at selected speeds. The 14 shafts extend from both ends of the gearmotor and from many



angles. They provide a variety of speeds and sources of power for machine tool drives. The Master Electric Co., Booths 123 & 124.

For more data circle No. 138 on postcard, p. 219,



Industry prefers STAR quality, prefers the blades made of carefully heat-treated, top-quality steel, fabricated on specially designed equipment – because STAR consistently delivers fast, economical metal cutting and long blade life.

Be sure to ask your Industrial Distributor for STAR "Moly" High Speed Steel Blades. STAR developed this high speed, heavily-alloyed steel blade of molybdenum. Remember, "Moly" High Speed blades outlast standard steel blades 10 to 1, cut as well as the best high speed steel blades made, but are substantially lower in cost.

FREE! Ask your Industrial Distributer for a supply of our NEW Metal Cutting Booklets and Wall Charts.



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CLEMSON BROS., Inc.

Makers of Hand and Power Hacksow Blades, Frames, Metal & Wood Cutting Band Saw Blades and Clamoon Lawn Mowers, PREVIEW | PRODUCTION ENGINEERING SHOW

Bends irregular shapes

Multiform benders are designed to produce irregularly shaped metal parts without the cost of special tooling, and are available in both hand and air-operated models. The unit illustrated is air operated and features the latest type 4-way bellows and a control valve which can be adjusted for speed. This makes it possible to have absolute control over the ram when intricate shapes are progressively formed with the



standard tooling that is furnished. With special tooling, compound bends can be formed in one stroke. Typical applications of this bender would include forming small stampings, bus bars, brackets, round or flat springs, automotive parts, electrical contacts, radio and electronic equipment parts, and many others. Capacity is ¼ x 4 in. mild steel. J. A. Richards Co., Booth 474.

Set screws

A new line of high-torque set screws can be torqued up to 40 pct higher. They are estimated to have as much as 23 times the holding power of conventional set screws. The new screws are made of alloy steel. They incorporate a





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NON-FLUID OIL

KEEPS PRESSURE SYSTEMS OPEN!

NON-FLUID OIL is outstanding for pressure systems because it will not choke up lubrication. NON-FLUID OIL contains no residual matter to elog fittings, it does not dry out like ordinary greases, and will not separate under pressure. Lubricates dependably until entirely used up. Keeps down maintenance cost.

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NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

series of design and fabrication changes, including fully formed threads, stronger and deeper sockets, and tighter overall tolerances. Standard Pressed Steel Co., Booth 828.

For more data circle No. 140 on postcard, p. 349.

Punch press feeders

A production setup similar to the one illustrated will be in operation, featuring an automatic coil cradle



and an automatic straightening and feeding machine delivering coil stock to a punch press. Two improved series of automatic feed units are available. Rowe Machinery & Mfg. Co., Inc., Booth 179.

For more data circle No. 141 on postcard, p. 249.

Ball bearing screws

The rolling ball bearing spline eliminates keyways and teeth as found in conventional sliding splines. These new units are actu-



ally multiple circuit ball bearing screws with infinite leads. Ball bearing screws are used in applications such as craft landing gears, hydraulic cylinders and machine tools. Saginaw Steering Gear Div., General Motors Corp., Booth 348.

For more data circle No. 142 on postcard, p. 249.

Optical dividing head

The new Leitz optical dividing head was conceived both as an instrument for inspection operations and as a dividing head for direct use on such machines as grinders, milling machines and boring mills. To increase its usefulness for inspection purposes, a special base

THE IRON AGE

PREVIEW | PRODUCTION ENGINEERING SHOW



plate is available on which additional testing fixtures can be mounted readily. Standard equipment allows driving the spindle by a detachable motor. The user may employ the motor drive for finishing the work after it is mounted in the dividing head, to make sure that the work will run true with the head's spindle. George Scherr Optical Tools, Inc., Booth 864.

For more data circle No. 143 on postcard, p. 249.

Materials carriers

These new bin and rack combinations can be locked to bases, permitting unit load handling of production line supplies by fork truck or similar equipment. The bases



are movable and are made with 8½ in. underclearance. This allows for easier plant cleaning and safe handling by fork truck. The racks can hold different quantities of all sizes of bins. The equipment is all-welded steel. Stackbin Corp., Booth 148.

For more data circle No. 144 on postcard, p. 249.

Control devices

Features of this exhibit include (1) vibrating parts feeders that orient parts and automatically feed them one at a time to processing equipment; (2) electric bin vibrators whose 3600 vibrations per minute cause stubborn materials to flow freely; (3) motor driven, balanced, dual-deck conveyors for long







Leading

Aircraft

use

aluminum

RED

Ryan



distances: (4) vibrating packers for settling bulk materials in containers ranging in size from small vials to large barrels: (5) hopper level switches that control the level of material in a bin or hopper; (6) bulk material flow control valves with no parts to jam or clog up. Syntron Co., Booth 554.

For more data circle No. 145 on postcard, p. 249.

Tapping attachment

This new tapping attachment claims to eliminate the human variable "lead error" obtained with conventional attachments. It operates on the "weightless tapping" principle and does not require any spindle pressure by the machine operator during the tapping operation. An exclusive axial



floating action is said to assure consistently uniform tapped holes. The fact that axial stress on the tap has been drastically reduced is claimed to increase tap life by as much as 40 pct. Positive torque control of a spring-loaded ball clutch greatly reduces tap breakage and work spoilage. The design of the clutch is claimed to make it practically impervious to wear. It will stop a dull or "loaded" tap promptly. Tapmatic Corp., Booth 645.

For more data circle No. 146 on postcard, p. 249.

Multiple plate clutch

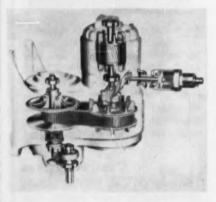
Now available for general industrial use, these oil-actuated multiple plate clutches claim certain distinct design advantages. The models are adaptable to remote or push button control without complicated linkage. High energy. high inertia, high horsepower clutches, they are particularly useful in applications creating high temperatures and operating under heavy, abusive loads. Ram travel increases automatically as the



pressure plate wears because the plate forms the ram of the cylinder. This eliminates adjustments to compensate for plate wear. Twin Disc Clutch Co., Booth 103. For more data circle No. 147 on postcard, p. 249.

Motor control

A sensitive and stable automatic control system permits Varidrive motor speeds to be controlled by such factors as pressure, tempera-



ture, humidity, viscosity, liquid level, tension, weight, position in relation to mechanical motion, CO., gas content, pH value, and electrical signals. U. S. Electrical Motors, Inc., Booths 815, 816.

For more data circle No. 148 on postcard, p. 249.

RED SEAL METALS CO

10035 BURTIS STREET, DEPT. B

SOUTH GATE, CALIFORNIA

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MACHINE TOOL SHOW

List of Exhibitors

Exhibitors	Booth No.	F
A		
AL W II T I G	***	Famco Machine Company 507
Abrasive Machine Tool Co.		Federal Press Company
The Ajax Mfg. Co	1309	Fellows Gear Shaper Co
American Gage & Machine	Co 417	Ferracute Machine Co
American Steel Foundries		Fitchburg Eng'g Corp
American Tool Works Co.	420	The Foote-Burt Company
Armstrong-Blum Mfg. Co. Arter Grinding Machine Co.	1200	
Aver Drillian Machine Co.	314	Fox Engineering Company
Avey Drilling Machine Co.		The Kaydon Eng'g Corp 806
Axelson Mfg. Co., Div. of I	F10	The Kayaon Eng g Corp
mousines ,	317	
		G
В		Gallmeyer & Livingston Co 906
Baker Brothers, Inc.	1421	Gardner Machine Company
Baldwin-Lima-Hamilton Corp	203	Gemco Shaper Company706
Barber-Colman Co Barber-Colman Co., Hendey	1322	Geometric Tool Co. Div.,
Barber-Colman Co., Hendey	Div 221	Greenfield Tap & Die Corp 223
Bardons & Oliver, Inc.		Giddings & Lewis M. T. Co 710
W. F. & John Barnes Co.		Gisholt Machine Company
Barnes Drill Co.	818	Gisholt Machine Company
Baush Machine Tool Co.	515	The Goss & deLeeuw Mch. Co1113
Beatty Machine & Mfg. Co	614	Gould & Eberhardt, Inc
Besly-Welles Corp.	404	The G. A. Gray Co
The Blanchard Machine Co E. W. Bliss Co.	1414	Greaves Machine Tool Div.,
The Bodine Corp		J. A. Fay & Egan Co. 721 Greenlee Bros. & Co. 1221
Bove & Emmes Machine Too	Co. 310	Greeniee bros. a Co
Brown & Sharpe Mfg. Co.	520	
Bryant Chucking Grinder (Co1015	H-I-J
Buffalo Forge Co	610	
Buhr Machine Tool Co.		The Hamilton Tool Co
The Bullard Company		Hanson-Whitney Co.,
		Div. of Whitney Chain Co 807
		Hartford Special Machinery Co 201
C		The Heald Machine Company 902
		The Hydraulic Press Mfg. Co 718
The Carlton Machine Tool	Co 919	Illinois Tool Works
Cincinnati Bickford Tool Co		Johnson Machine & Press Corp 411
Cincinnati Gilbert M. T. Co		Jones & Lamson Machine Co
Cincinnati Lathe & Tool Co	309	
Cincinnati Lathe & Tool Co	Co1205	K-L
Cincinnati Milling Machine	Co.	
Products Division	306	V-1 M-4: C 1210
The Cincinnati Shaper Co.		Kaukauna Machine Corp
Clearing Machine Corporal		Kearney & Trecker Corp. 508 The Kempsmith Machine Co. 616
Cleereman Machine Tool		Kent-Owens Machine Co
Cleveland Automatic Mch. Cleveland Crane & Eng'g		Kingsbury Machine Tool Corp. 915
Cleveland Grinding Mch.	Co. 810	W. B. Knight Machy, Co
Cleveland Tapping Mch. Co	409	L & J Press Corp. 407
Colonial Broach Company	1112	L & J Press Corp. 407 Lake Erie Eng'g Corp. 1310
Cone Automatic Mch. Co.	. Inc 401	Landis Machine Company
Consolidated Machine Tool	Corp 217	Landis Tool Company
Covel Manufacturing Co.	720	Lapointe Machine Tool Co
The Cross Company		The R. K. LeBland M. T. Co
		The Lees-Bradner Company
		The Ledge & Shipley Co
D-E		Logansport Machine Co., Inc
Danly Mch. Specialties, Inc	c	M
Davis & Thompson Co		M
The Denison Eng'g Co.		
DeVlieg Machine Co.	1317	Mattison Machine Works
Economy Engineering Co.	704	Michigan Tool Co1220
Edlund Machinery Co.,		Micromatic Hone Corp
Div. of Bradley-Edlund C Ex-Cell-O Corporation		The Minster Machine Co. 1410 Moline Tool Company 1304
Ex-Cell-O Corporation		moine 1001 Company

International Amphitheatre Chicago September 6-17, 1955

	Monarch Machine Tool Co
	N
	The National Acme Company .705, 324 National Automatic Tool Co., Inc
	O-P
,	The Ohio Machine Tool Co. 301 Oliver Instrument Co. 604 Onsrud Machine Works, Inc. 812 The Oster Manufacturing Co. 216 Parker-Majestic, Inc. 415 Peerless Machine Company 322 Pope Machinery Corp. 117 Pratt & Whitney Div. Niles-Bernent-Pond Co. 1219
	R-S-T
	Racine Hydraulics & Mchy., Inc. 102
	U-V-W
	U. S. Tool Co., Inc. 215 Van Norman Company 905 Vickers, Inc., Div. of 814 The Sperry Corporation 814 The Warner & Swasey Co. 717 Wiedemann Machine Company 1420 Wysong & Miles Company 913
	Non-member companies
	A. M. T. D. A. F. E. Anderson Oil Company, Inc. 225 A. S. M. E. 126 Automotive Industries 204 Carboloy Dept of General Electric Co. 109 Cutting Tool Mfg. Assn. 303 E. F. Houghton & Company 318 The Iron Age 119 Kennametal, Inc. 123 Secony-Vacuum Oil Co., Inc. 314 Sun Oil Company 112

PRODUCTION ENGINEERING SHOW

Navy Pier, Chicago September 6-17, 1955

List of Exhibitors

Enhibitore		Booth No.	Electer Demands Die		Morse Chain Co
Exhibitors		Booth No	Electro Dynamic Div.,		
	A		General Dynamics Corp		National Diamond Laboratory 551
			Emece Corp	112	National Pneumatic Co., Inc.
Adamas Carbid	· Corn	441	Encyclopedia Britannica	833	and Holzer-Cabot Div 439
			Contact District Assess Equipment Co	440	Nelson Stud Welding,
Advance Produ			Equipto Division Aurora Equipment Co		
Airborne Instru	ments Labore	story, Inc. 53	Errington Mechanical Laboratory, Inc	249	Division of Gregory Industries, Inc 454
Aircraft Marine			Etteo Tool Co	. 527	New Departure Div.,
					General Motors Corp 537
Alar Design Inc			F.G.H		New Hermes Engraving Co 430
Alemite Division	Stewart-Wa	rner Corp. 416	F-6-M		
Allen-Bradley C	0	24			New Standard Division,
Louis Allis Co.			The Fafnir Bearing Co	. 131	U.S. Expansion Bolt Co 813
			Fairbanks, Morse & Co	442	The New York Air Brake Co 514
Aloris Tool Co.	********	341			New York Belting and Packing Co 556
American Actua	stor Corp	461	Farrand Optical Co., Inc.		
American Cysto			Ferguson Machine & Tool Co., Inc	. 852	Northwestern Tool & Engineering Co 847
			Firth Sterling Inc	. 837	
American Sip C			Formsprag Co		O-P-R
Ampso Metal, I	nc	510			
Apex Tool & Cu	Her Co	851	Franklin Control Corp		Oakite Products, Inc
			Furnas Electric Co	. 749	O'Neil-Irwin Manufacturing Co 125, 126
	-		General Box Co	532	Optical Gaging Products Inc 412
			General Electric Co 107, 108		The Osborn Manufacturing Co 856
Balance Engine	ering Co.	43	Graham Transmissions Inc.	. 540	The Parker Appliance Co 415
Balcrank, Inc .			Green Instrument Co., Inc		
					Pneuma-Serve Inc 117
Barrett-Cravens	Co	45	Wm. Halpern & Co., Inc.	. 352	Portman Instrument Co., Inc 366
The Barry Contr	ols Corp	15	Hamilton Automation, Inc.	. 810	PurOlator Products, Inc
Bill-Dee Corp.,			Hamilton Manufacturing Co 751		Reliance Electric &
	Industr Div	470			
		47	F. Word Harman Associates		Engineering Co
G. S. Blakeslee	& Co	44	Hevi Duty Electric Co	. 252	Ren-Ite Plastics, Inc 344
Boice Manufact	uring Co., In	c. 82	Hillyer Instrument Co., Inc		Revco, Inc 672
Boston Gear W					J. A. Richards Co 474
					J. A. Richards Co
The Bristel Co.			The Hole-Krome Screw Corp	. 431	Roller Bearing Co. of America 829
Brooks Equipme	nt & Mfg. C	0 52	Horton Chuck Division,		The Rotafeed Co
Scott Brown Co	orp.		E. Horton & Son Co	836	Rowe Machinery & Manufacturing Co. 179
					many a management of the
Charles Bruning			Houghton Laboratories, Inc	. 034	
Buck Manufact	uring Co	19	Hyatt Bearing Div.,		
			General Motors Corp	519	Safety Socket Screw Co 824
	C				
	-		1.11		Saginaw Steering Gear Div.,
			I-J-K		General Motors Corp 348
C. I. T. Cerp.					Schauer Manufacturing Corp 245
Carboloy Dept.	, General El	ectric Co.	I-T-E Circuit Breaker Co	. !!!	George Scherr Optical Tools, Inc 864
665 667 6	69 670 765	767, 769, 77	Illinois Metal Products	. 165	George Scherr Optical Tools, Inc 664
			Imperial Stamp & Engraving Co., Inc		Scully-Jones and Co
Cargill Detroit					Shell Oil Co 154
Century Electric	c Co	criestrias 41	Industrial Diamond Asso. of America	a 137	The Skinner Chuck Co. 508
Challenge Mac	hinery Co.	52	The Jacobs Manufacturing Co 104	1. 105	The Skinner Chuck Co. 508 The S-P Manufacturing Corp. 115
Chemical Deve			The Charles L. Jarvis Co		for all Control Div
					Speed Control Div.,
Chicago Dial I				0, 411	Fairchild Engine and Airplane Corp. 744
Chicago Rivet	k Machine C	0 14	Koebel Diamond Tool Co	526	Sperry Products Corp 451
The Clark Cont	roller Co		Kux Machine Co		Spiral Step Tool Co
Clark, Cutter at			MAX INGCHINE CO	, 144	Square D Co
			10.220		
Cleveland Instr			L-M-N		Stackbin Corp
Collins Microfle					Standard Oil Co. (Indiana) 464
Commercial Fil			Lapeer Manufacturing Co	. 510	Standard Pressed Steel Co 828
Control Engine					The L. S. Starrett Co 144, 145
Cooper-Weymo	uth Inc		Lee Spring Co., Inc.	. 15/	Supreme Products, Inc 242
Copy-Craft, Inc		54	Lehmann Baring Tool Div. of		Swivelier Co., Inc
Crucible Steel	Co. of Ame	rice	Fulton Iron Works Co	569	Synthane Corp 142
					Syntron Co
		830, 831, 83			Syntron Co
The Cushman	Chuck Co ,	.419, 420, 42	American Machine & Foundry Co	. 349	T
Cutler Hammer	r Inc.	423 42	Linemaster Switch Corp	. 552	
			Link Belt Co		Tapmatic Corp 645
			71 1 111 0 1 0	F70	
	D-E		The Lufkin Rule Co		Teer, Wickwire Inc 546
	-1		Magnaflux Corp	. 820	G. H. Tennant Co 520, 521
Dolco Products	Div. of Go	eneral	Marathan Blackle Manufacturing Co		The Timken Roller Bearing Co 425, 426
Motors Core		52			Toledo Scale Co
The D. William		122 12		. 010	7-14 Mar (-1-1-2
The DeVilbiss C		100, 15	Marvel Engineering Co	. 809	Torit Manufacturing Co 646
Diehl Manufac	turing Co.	42	The Master Electric Co		Trabon Engineering Corp 422
The DoAll Co.		40	May Essa Essalassias Inc		Tri-Kris Co 127
			the state of the s		
Drillmation Co.			interest and interest and a section of the section		The Tumpane Co., Inc 409
Allen B. du Mo	nt Laborato	ries, Inc 81		1. 844	Twin Disc Clutch Co
The Dumore C	a., Racine	54	Micrometrical Mfg. Co	ASI	
Durent Manufa				. 001	U-V-W-
SAME PROPERTY AND PROPERTY PARTY.	eturing Co	16			
	eturing Co.		mineral and and matering a solet of		
Eagle Signal	Corp.	14	Midwestern Instruments	. 140	U. S. Flectrical Motors Inc 815, 816
	Corp.	14	Midwestern Instruments	. 140	U. S. Electrical Motors Inc. 815, 816 Union Manufacturing Co. 159

United States Rubber Co	102
Valvair Corp	835
Vapor Blast Mfg. Co	
Vascoloy-Ramet Corp246,	
Veeder-Root Inc.	.240
Vickers Electric Division, Vickers, Inc	
E. F. Vilter Sales, Inc	456
Visual Plant Layouts Inc.	
Wagner Electric Corp	129
Warner Electric Brake & Clutch Co	
The Warner & Swasey Research Corp.	428
Jervis B. Webb Co	518
Westinghouse Air Brake Co	149
Westinghouse Electric Corp 401	, 403
West Point Mfg. Co	266
S. J. Williams Precision Tool Kits Inc.	.171
Wilson Mechanical Instrument Div	116

Shaw-Box Crane & Hoist Div. Maserati Corporation of America "Master's with Arboga" Mead Specialties Company Metalmaster Division Metal Removal Company Mitts & Merrill, Inc. Neff, Kohlbusch & Bissell, Inc. Nicholas Equipment Co. Nord International Corporation O'Neil-Irwin Manufacturing Co. Pangborn Corporation Pioneer Tool Engineering Co. Portage Double-Quick Tool Co. Portage Machine Company Production Machine Co. Raytheon Manufacturing Company **Equipment Marketing Division** Waltham 54, Mass.

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Walker-Turner Division
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Wells Manufacturing Corp.
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COLISEUM MACHINERY SHOW

September 6-17, 1955

List of Exhibitors

American Herforder Corp. American Positive Grip Vise Corp. American Pullmax Co., Inc. Armstrong Brothers Tool Co. Atlantic Instrument Corp. Atlas Press Company Bansbach Machinery Company Barsoca Machine Company Barer Engineering & Machinery Co., Ltd. Black Drill Cempany Robert Blohm & Company Boice-Crane Company Burg Tool Manufacturing Co., Inc. Cincinnati Manufacturing Corp. Clinton Machine Co. Clinton Machine Co.
Commander Manufacturing Co.
Crystal Late Machine Sales Corp.
Dake Engine Company
A. P. de Sanno & Sen, Inc. Machinery Division Diamond Saw Works, Inc. DoAll Company DoAll Midwest Co. Easco Products
East Chicago Machine Tool Corp.
Electro Arc Sales Company
Elgin Tool Works, Inc. Fawick Airflex Division Fawick Corporation Fawick Corporation Fenn Manufacturing Co. Fenn Manufacturing Co.
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Lake Shore Engineering Co.
K. O. Lee Company
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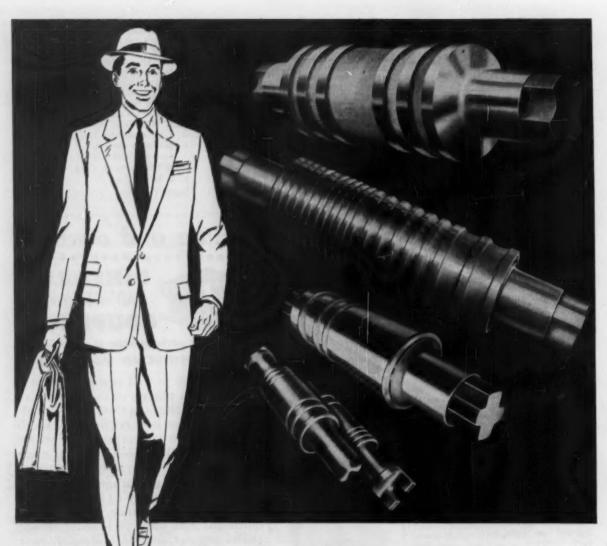
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278

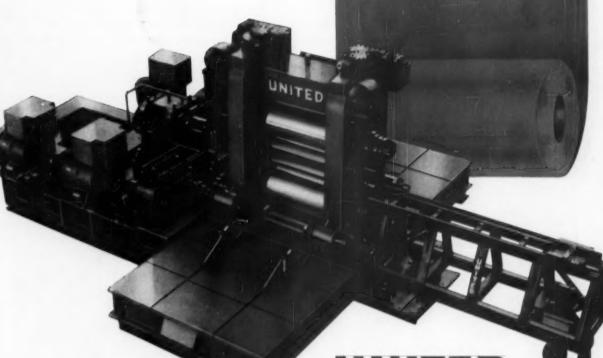
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The Iron Age SUMMARY...

Talk of easier steel deliveries wishful thinking . . . This fall will see previous records fall . . . No letup in auto steel demand coming.

New Records Coming . . . The steel industry is headed for new records in order volume, in production and in the delicacy of customer relations. These will start building after Labor Day and will swamp individual steelmakers. Customers yelling for steel "haven't seen anything yet."

The slight dip in auto steel shipments served but to butter up some angry feelings of other steel customers whose deliveries were hopelessly behind original promises. Some statements that steel supply will be in better shape by the fourth quarter are wishful thinking.

Soon the auto industry will be stepping up its already high level order volume for sheets, bars, stainless and other products. The pace of 1956 car output will be even with or ahead of last year's fast tempo.

Demand to Tax Capacity . . . During the balance of this year demands from construction, railroads, farm implement makers, appliance manufacturers and from hundreds of miscellaneous steel users will be piled upon the record requirements of the auto industry. There will be enough incessant steel demand to support 100 per cent operations for some time.

But mills are in no position to reach 100 per cent operations in the near future. Repair programs are not completed—hurricane rains set one large steel plant on its ear this week. More rehabilitation is needed to put equipment in tip-top shape. Steel deliveries will slip further behind in September and backlogs will mount.

There has been no appreciable gray market tonnage because ingots have been unavailable. Finishing mill space for purchased ingots is hard to find. Foreign steel is not factor in this boom—as it was in the past. The opposite is the case. Europeans want our steel.

No Daisy Chain Yet . . . Steel firms are keeping close tabs on their secondary steel. Warehouses are screening their customers. Daisy chain operators so far have not latched onto large tonnages of steel which they could easily sell at premium prices. But if current market conditions get much tighter, it is certain that premium markets will flower over night.

The hard hit northeastern sections of the country will need large tonnages of structural and plates for bridges knocked out by flood waters. Emergency calls will be made.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year
(Net tons, 000 omitted)	2,197	2,173	2,190	1,515
Ingot Index (1947—49=100)	136.5	135.4	136.3	94.3
Operating Rates				
Chicago	95.5	95.0	96.0	66.0
Pittsburgh	98.0	95.0*	0.001	64.0
Philadelphia	81.0	87.0*	90.5	56.0
Valley .	93.0	92.0*	94.0	62.0
West	98.0	96.5*	102.5	75.5
Detroit	57.0	89.0*	89.0	74.0
Buffalo	100.0	100.0	105.0	56.5
Cleveland	100.0	98.0*	99.0	54.0
Birmingham	95.0	70.0	94.5	65.0
S. Ohio River	92.5	90.5	86.0	72.0
Wheeling	99.0	99.0	95.0	77.0
St. Louis	104.0	96.0	98.0	46.5
Northeast	81.5	93.5	88.0	48.0
Aggregate	91.0	90.0*	94.0	63.5
*Revised				

Prices At A Glance

cents per lb unless otherwise	noted) This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.801
Pig Iron (Gross ton)	\$59.09	\$59.09	\$59.09	\$56.59
Scrap, No. 1 hvy				
(gross ton)	\$43.83	\$43.83	\$41.50	\$28.67
Nonferrous				
Aluminum, ingot	23.20	23.20	23.20	22.20
Copper, electrolytic	36.00	36.00	36.00	30.00
Lead, St. Louis	14.80	14.80	14.80	13.80
Magnesium, ingot	29.25	29.25	29.25	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	96.00	96.625	98.25	93.25
Zinc, E. St. Louis	12.50	12.50	12.50	11.00

Delivery Delays Mount

Railroad car push tightens light plate supply . . .

Detroit will not ease requirements . . . Hot-rolled strip gets tighter . . . Fall pickup effect is still to be felt.

♦ ALL STEEL PRODUCTS are tight with little chance of any easing for some time. The major market factor to watch is this: superimposed on present tight market is normal Fall pickup in demand. Thus any analysis now doesn't take into account the full impact of what's coming in September and October.

Many steel users who have had their commitments cut are calling on steel sales officials—one sales official in the midwest says he averaged 10 to 12 such calls a day last week. Some buyers are shaking defense priorities at steel people, trying to get their regular (reduced) supply from one mill and the defense steel from another. But mills are double checking on this approach.

In Detroit there are no indications of planned production cutbacks of more than a week or two. This means that mill hopes of being able to clear up schedules on a lull from automakers have been dashed. Tightness from this source is expected to continue right through the end of the year, at least.

Eastern consumers can expect delays in bar and structural shape shipments due to flood damage at Bethlehem Steel's Bethlehem plant. Extent of the delays is still uncertain.

Latest item to establish itself on the very tight list is plate. This has been aggravated by recent upsurge in railroad car orders. With hot-rolled strip demand very strong it's been just about impossible to find any space for light plate on the strip mills that have previously rolled plate in emergencies.

Warehouses have been flooded with orders and their receipts have been cut back from expected levels.

SHEETS AND STRIP ... Sold out through the fourth quarter in Pittsburgh with customers lining up to get on '56 order books. Delivery delays run from 2 to 8 weeks, average 6, and fourth quarter cutbacks are coming. Detroit reports no sign of more than 1 to 2 week model changeover shutdowns, so no easing likely from that quarter. Hot-rolled strip is getting tighter in Chicago, as elsewhere. On both hot and cold-rolled sheet and strip, the automotive buyers had eased off their buying in Chicago during July but it brought no relief to other consumers. When auto interests return to the market the fur will fly. Galvanized sheets in the Midwest are going to be harder to get: U. S. Dept. of Agriculture last week ordered 13 .-000 grain bins (Cost \$10.3 million installed).

TINPLATE . . . U. S. Steel Corp. announced a 5.5 pct price increase in tinplate, effective Oct. 1. The increase was 40¢ a base box on electrolytic and hot dipped tinplate, black and terneplate. Special coated manufacturing terneplate was advanced 85¢ a base box.

BARS... In all areas bars are now as tight as cold-rolled sheets. In Cieveland and Chicago demand is piling up and there's trouble in sight for the fourth quarter. Pittsburgh is booked through the fourth quarter but hasn't cut back as much as on flat rolled products. On the West

Purchasing Agent's Checklist:

MACHINE TOOLS: Show previews p. 218

PRODUCTION ENGINEERING: Show previewsp. 264

LABOR: Coal wages up p. 165

STEEL: Market tighter p. 279

Coast bar demand is strong, led by automotive. The Eastern market is also booked solid for the year, will be further upset by damage to Bethlehem bar mills caused by last week's record flood. Bethlehem could not estimate exactly at press time but certainly the loss will be at least a week's output. The easy bar situation prevailing in Detroit less than a year ago has now turned a complete flip. There, carbon bars in some sizes may actually lead the parade of tight items. Alloy bars are a little better in Detroit than carbon.

STRUCTURALS . . . No signs of easing in construction demand for some time mean continued tightness. In Pittsburgh, with four quarter sold, substantial carryovers to 1956 are due. Deliveries are running 6 to 8 weeks behind. In the East, Bethlehem stands to lose at least a week's production due to a flood, though actual loss could not be accurately estimated at press time. Flood repairs throughout New England and Pennsylvania will jam all structural schedules.

WIRE PRODUCTS . . . Merchant wire is on 8 week delivery in Cleveland: fence and netting are in a seasonal lull. Merchant wire is seasonally low in Pittsburgh. Sizes used by automakers are tight and Detroit reports buyers have told mills they intend to keep ordering through the year. Construction wire products, now several weeks behind, should be current in Pittsburgh by October. At Worcester, the American Steel & Wire plant, damaged by last week's flood will lose as much as 3 weeks in some departments. Flood has skyrocketed demand for wire throughout affected areas of New England and Pennsylvania.

·WAREHOUSES . . . While warehouse tonnages are small in most cases, Detroit suppliers are finding that a little demand by a lot of new customers has added up to a boom. Meanwhile, warehouses are finding it hard to rebuild stocks. Deliveries in Pittsburgh are worse than ever, with average inventories of 50 pct of normal and some grades down to zero. In Chicago, business apparently hit a seasonal dip of about 15 pct last month, is now bouncing back to recover part of that loss. Light plate is extremely critical in Chicago.

CANADA... Steel Co. of Canada has posted a \$4 per ton increase. New prices, per 100 lb: bars, \$4.80; plate, \$4.85; HR sheets, \$4.50; CR sheets, \$5.45; galvanized a eets, \$6.05; wirrods, \$4.925.

Comparison of Prices

Aug. 16

(Effective Aug. 22, 1955) July 26 1955

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittaburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in Italics.

**	Aug. 23	Aug. 16	July 26	Aug. 24
Flat-Rolled Steel: (per pound)	1000	1000	1000	1300
Hot-rolled sheets	4.325¢	4.3254	4.3254	4.054
Cold-rolled sheets	5.325	5.325	5.325	4.95
Gaivanised sheets (10 ga.)	5.85	5.85	6.86	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.22	5.82
Plate	4.52	4.52	4.52	4.237
Plates wrought iron	9.30	9.30	9.80	9.30
Stainl's C-R strip (No. 302)		44.50	44.50	41.50
Tin and Ternplate: (per base bo-	x)			
Tinplate (1.50 lb.) cokes	. 89.05	20.02	\$9.05	\$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. terns	7.85	7.85	7.85	7.78
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.312d
Cold-finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	. 38.25	38.25	38.25	35.50
Wrought iron bars	. 10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire		6.254	6.254	8.75¢
Rails: (per 100 lb.)				
Heavy rails		84.725	84.725	84.45
Light rails	. 5.65	5.65	5.65	5.86
Semifinish Steel: (per net ton)				
Rerolling billets		\$68.50	\$68.50	864.00
Slabs, rerolling	. 68.50	68.50	68.50	64.00
Forging billets	. 84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	. 96.00	96.00	96.00	86.00
Wire Rod and Skelp. (per pour				
Wire rods		5.025¢	5.0254	4.675∉
Skelp	4.325	4.225	4.225	8.90
Pinished Steel Composite: (per	nound)			
Base price		5.174d	5.174¢	4.801€

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Phila-delphia, Buffalo, Valley and Birmingham.

Pig Iren: (per gross ton)
Foundry, del'd Phila.
Foundry, Valley
Foundry, Southern, Cin'ti
Foundry, Birmingham
Foundry, Chicago
Basic, del'd Philadelphia
Basic, Valley furnace
Malleable, Chicago
Malleable, Valley
Ferromanganeos], cents per lb.
3 74-76 pet Mn base. \$61.19 56.50 80.43 59.09 62.93 55.09 59.00 62.77 58.50 59.00 62.93 62,93 82.98 55.00 59.00 62.77 58.50 59.00 59.00 9.50¢ 52.93 55.00 59.00 42.77 58.50 59.00 59.00 3.50¢ 54.50 60,27 56,00 56,50 10.00# 959.09 \$50.09 254.59 \$44,50 46,50 40,60 38,50 46,50 44,50 42.50 40.50 84.50 39.50 23.50 31.00 42.50 42.50 44.50 45.00 50.50 40.50 46.50 52.50 Steel Scrap Composite: (per gross ton)
No. 1 heavy melting scrap ... \$43.88 \$28,67 Coke, Connellaville: (per net ton at oven)
Purnace coke, prompt \$18.25
Foundry coke, prompt 16.25

Nonferrous Metals: (cents per pound to Copper, electrolytic, Conn. 84.00 Copper, Lake, Conn. 36.00 Tin, Straits, New York 96.69 Zinc, East St. Louis 12.60 Lead, St. Louis 14.80 Aluminum, virgin inged 23.20 Nickel, electrolytic 47.47 Magnesium, ingot 29.35 Antimony, Laredo, Tex. 28.60 † Tentative. 2 Averags. Revised. large buyers)
26.00 36.00
36.00 36.00
96.635 98.25
12.50 12.50
14.80 14.80
28.20 28.20
67.67 67.67
29.28 29.25
28.50 28.80 30.00 30.00 93.25 11.00 13.80 22.20 63.08 27.75 28.50

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittaburgh, Phila-delphia and Chicago.

PIG IRON

Dollars per gross ton, f.a.b. subject to switching charges.

STAINLESS STEEL

←To identify producers, see Key on P. 291->

Base price cents per lb. f.e.b. mill

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.	
Bathleham B3	60.50	61.00	61.50	62.00		
Birdsbero, Pa. B6	60.50	61.00	61.50	62.00		
Birmingham R3	54.50	55.88				
Birmingham 1/9	\$4.50	\$5.00	59.00			
Birmingham U4.	54.50	\$5.00	59.00			
Buffalo R3	58.50	59.08	59.58			
Buffalo HI	58.58	59.00	50.50			
Buffalo W6	58.50	59.00	59.50	60.00		
Chester C17	54.50	55.00	55.50			
Chicago I4	58.50	59.00	59.88	59.50		
Cleveland A5	58.50	59.00	59.00	59.50	63.50	
Cleveland R3	58.50	59.00	59.00			
Daingerfield L3.	55.00	55.00	55.00			
Duluth 14	58.50	59.00	59.00	59.50		
Eria 14	58.50	50.00	59.00	59.50		
Everett M6		61.00	61.50			
Fentana K1	64.50	65.00				
Genera, Utah C7	58.50	59.00				
Granite Ci y G2.	60.40	60.90	61.40			
Hubbard YI			59.00			
Minneaux C6	60.50	61.00	61.50			
Monessen P6	58.58					
Neville Is. Pf.	58.50	59.00	59.60			
N. Tonawanda TI		59.60	59.50			
Pittsburgh UI	58.50			59.50		
Sharpaville S3	58.50	59.00	59.00	59.50		
So. Chicago R3	58.50		59.66			
Steel on B3	60.50	61.00	61.58	62.00	66.54	
Swedeland A2	69.50	61.00	61.50	62.00		
Toledo 14	\$8.50	59.00	59.00	59.50		
Trey, N. Y. R3	69.50	61.00	61.50	62.00	66.54	
Toungstown Y/		1	\$9.00	59.50		

* DIFFERENTIAL5: Add, 50¢ per ton for each 0.25 pct silicen over hase (1.75 to 2.25 pct except low phos., 1.75 to 2.80 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional, 0.25 pct nickel.

austriamas, 0.20 pct mecaes. Silvery irans: Buffalo, H1, \$68.75; Jackson, J1, G1, \$67.50. Add \$1.00 per ten for each 0.50 pct allicen over hase (0.01 to 6.50 pct) up to 17 pct. Add \$1 pct ton for 0.75 pct or more plauspharus. Add 75¢ for each 0.50 pct mánganese over 1.0 pct. Bessomer forresilicon prices are \$1 over comparable silvery iran.

* Unravised.

Preduct	301	362	383	304	316	321	348	410	416	436
Ingets, rereiling	17.75	19.00	-	29.25	31,50	25.00	37.75	15.60	-	15.25
Slabs, hillets, rerelling	22.25	24.75	24.75	25.00	40.25	32.00	49.50	19.50	-	19.75
Forg. diacs, die blocks, rings	-	-	-	-		-	-	-	-	-
Billets, forging	-	32.00	34.75	23.75	51.25	38.25	58.00	25.50	25.00	26.00
Bars, wires, structurals	35.60	38.25	41.00	49.25	60.75	45.25	68.00	30.50	31.00	31.66
Plates		40.25		43.00	64.00	49.25	73.25	31.75	Contr	32.25
Shoets	44.25	44.50	-	47.25	66.25	54.25	82.60	36,25		36.71
Strip, hat-rolled	32.00	34.50	-	37.25	58.25	44.25	66.75	400		-
Strip, cold-rolled	41.00	44.50	-	47.25	64.25	54.25	82.00	36.25	-	36.71

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Buther, Pa., A7; McKeespert, Pa., U1; Washington, Pa., W2, J2; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Philadelphia. D5.

Strip: Midland, Pa., C1; Cleveland, A5; Carnegie, Pa., S9; McKeespert, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillee, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (.25¢ per lb higher); W1 (.25¢ per lb higher); New Bedford, Mass., R6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., 2; McKonsport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., 11; Watervlist, N. Y., A3; Waukogan, A5; Canton, O., T5; Ft. Wayne, 14; Philadelphia, D5; Detroit, R5.

Wire: Waukegan, A5; Massillon, O., R5; McKossport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimere, A7; Dunkirk, A5; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, III., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge Pa., A3; Chicago, UI; Mushall, Pa., UI; Midland, Pa., UI; New Castle, Ind., 12; Middletown, A7; Washington, Pa., J2; Cleveland, Massillson, R3; Casteeville, Pa., C15; Philadelphia, D5.

Forged discs, die blocks, rings: Pittsburgh, CII; Syracuse, CII; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKasupart, F1; Massillon, Canton, O., R3; Watervlist, A3; Pittsburgh, Chicago, U1; Syracum, C11.; Datroit, R5

Prices Hold in Buying Lull

Price action awaits new mill orders . . . High steel rates bar major break . . . New York and Birmingham report strong export demand . . . No change in composite.

 SCRAP STORY this week is one of prices holding in the absence of new mill orders.

General feeling was that major new orders would establish higher prices and that the mills will have to come in for heavy tonnage soon.

Pressure on the mills for high production is seen barring any serious break in scrap prices. And scrap supplies figure to tighten still more before easing. In Detroit, automotive tonnages are down. In the East, flood conditions will disrupt normal scrap production in hard-hit areas.

Export continues strong. Heavy activity is reported on both the Atlantic and Gulf coasts as the mills decline to price foreign buyers out of the market.

Philadelphia, Pittsburgh and Chicago all reported No. 1 heavy melting prices unchanged and little movement of other grades. The Iron Age Composite for No. 1 heavy melting remains at \$43.83.

Pittsburgh . . . The scrap market continues to be somewhat uncertain in the absence of mill purchases and very little broker buying. Small tonnages of openhearth scrap have been sold to brokers at \$1 or \$2 below current prices, but these are, more or less, distress sales. Any sizeable mill purchase would command the higher figure. A feeler between one of the local mills and the brokers reportedly placed a price on No. 1 heavy melting at \$43, but was turned down. Cast grades showed additional strength on the basis of latest purchases. Blast furnace grades are unchanged.

Philadelphia . . . An uneasy silence followed the East's disastrous floods. The trade debated only how much the market could rise when buys are made. Floods curtailed scrap generation in this market's sources and railroad washouts severely hampered transportation. Mills were not any too long on inventory before the flood and difficulty obtaining good scrap, plus competition from a strong export market, were sure to drive prices upward.

Chicago . . . With the stage all set for a price decline last week, Chicago's market ignored the stage settings and clung to previous levels. An absence of heavy mill buying, along with a limited amount of mill purchasing of No. 2 hvy melting at the bottom of the spread, failed to weaken most scrap grades. Brokers began to cover No. 2 hvy melting at buying prices as low as \$33, but were unable to buy No. 1 hvy melting in more than limited tonnages on an offer of \$39. With only 1 week to go until the end of the month, it appeared that dealers were willing to hold their scrap in anticipation of strengthening prices as the new mill orders for September delivery begin to come in.

New York ... The market here continues strong and active. Steelmaking grades are up \$1 to \$2. Other grades hold firm at going levels. Mill buying has been off a little but this is due more to an unwillingness to push prices higher while old orders are being cleared up than to any weakness. Export is strong and ready to take up any domestic black.

Detroit ... This is a period of watchful waiting in the Detroit scrap market but veteran observers here agree there is enough underlying strength to give prices a strong upward shove when competitive bidding starts next week on the new industrial lists. At last three factors have to be considered: 1. Local mills are operating near capacity, have bought little scrap recently; 2. Because of new model changeovers, August industrial scrap tonnages are expected to fall

at least 50 pet behind last month's total; 3. Detroit may again become the favorite raiding ground for other districts as well as Canadian mills.

Cleveland . . . After several weeks without a major order, a price break appeared in the offing. Larger brokers continued optimistic however, although mills are showing heavy price resistance. Some weakness was shown in Cleveland by an inside sale at \$43 some time ago. Valley market continued good on shipping of old orders with tonnage being drained from stagnant Cleveland area. Railroad grades were stronger in the Valley and foundry buying in Cleveland continued active with \$1 rise.

Birmingham . . . Cast grades remained strong this week with brokers covering at higher prices than the mills are paying. Several nearby foundries have raised their prices for out-of-the area cast. The major Birmingham consumers, however, refuse to advance over the \$47.00 level because of the large supply of pig iron. Trading in openhearth grades has come to a stand-still.

St. Louis . . . With prices in other sections off, the competition for scrap has been lessened for the mills here. RR hvy melting, rail 18" and under and cupola cast are up \$1. Hvy breakable cast is off \$4 as a result of a new price set by the leading consumer here.

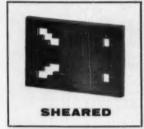
Cincinnati . . . Market continued quiet awaiting monthly automotive plant list. Shipments on old orders to area mills and by barge to Pittsburgh continue in good volume but some price weakness is expected on new orders. Foundry buying only fair.

Buffalo . . . Dealers report ample scrap is available within current price ranges to cover recent sales. There was no new bidding of any consequence during the week and the market was generally steady.

Boston... Some slackness has developed here after several weeks of brisk activity. However blast furnace grades rose \$1 on the average.

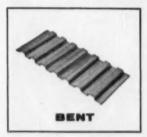
West Coast . . . Prices are holding steady in Seattle, San Francisco, and Los Angeles. Some mills are chewing deeply into inventories. But they insist they're getting all they need and sren't worried about the heavy export tonnages leaving all major West Coast ports.















STEEL PLATE SHAPES SERVICE CAN HELP YOU SAVE 5% TO 25% ON COMPONENTS

You can cut production costs—save from 5% to 25% on components—by using By-Products Steel Co.'s Steel Plate Shapes Service to pre-form your parts.

With this Service you can reduce fitup and finishing costs, eliminate one or more production steps, cut scrap losses and extra freight and handling charges. Operations are speeded by freeing men and machines for other work, and costly plate inventories are reduced.

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STEEL PLATE SHAPES SERVICE

BY-PRODUCTS STEEL CO.

A Division of Lukens Steel Company, Coatesville, Pennsylvania

Pittsburgh

No. 1 hvy. melting	\$44.00	to	\$45.00
No. 2 hvy, melting	41.00	to	42.00
No. 1 bundles	\$4.00	to	45.00
No. 2 bundles	37.00	to	38.00
Machine shop turn	27.50	to	28,50
Mixed bor, and ms. turns	27.50	to	28.50
Shoveling turnings	30,50	to	31,50
Cast iron borings	30.50	to	31.50
Low phos. punch'gs, plate.	48.00	to	49.00
Heavy turnings	42.00	to	48.00
No. 1 RR, hvy, melting	47.00	to	48,00
Scrap rails, random igth	50.50	to	61.50
Ralls 2 ft and under	54.00	to	55.00
RR, steel wheels	51.50	to	52.50
RR. spring steel	61,50	to	62.50
RR. couplers and knuckles	51.50	to	52.50
No. 1 machinery cast	45.00	to	46.00
Cupola cast	41.00	to	42.00
Heavy breakable cast	. 36.00	to	37.00

Chicago

No. I hvy. melting	40.00 to	\$41.00
No. 2 hvy, melting	34.00 to	85.00
No. 1 factory bundles	44.00 to	45.00
No. 1 dealers' bundles	41.00 to	42.00
No. 2 dealers' bundles	\$1.00 to	32,00
Machine shop turn	27.00 to	28.00
Mixed bor, and turn	29.00 to	30.00
Shoveling turnings	29.00 to	20.00
Cast iron borings	39.00 to	20.00
Low phos. forge crops	48,00 to	49.00
Low phos., punch'gs, plate.	46.00 to	47.00
Low phos. 3 ft and under	45.00 to	46.00
No. 1 RR, hvy, melting	47.00 to	48.00
Scrap rails, random igth	62.00 to	53.00
Rerolling rails	64.00 to	65.00
Ralls 2 ft and under	57.00 to	
Locomotive tires, cut	45.00 to	46.00
Cut bolsters & side frames	48.00 to	49.00
Angles and splice bars	63.00 to	54.00
RR. steel car axles	54.00 to	65.00
RR. couplers and knuckles	50.00 to	51.00
No. 1 machinery cast	52.00 to	53.00
Cupola cast	47.00 to	48.00
Heavy breakable cast	39.00 to	40.00
Cast iron brake shoes	37.00 to	
Cast iron car wheels	44.00 to	45.00
Malleable	\$1.00 to	
Stove plate	39.00 to	40.00

Philadelphia Area

No. 1 hvy. melting	46.00	to	\$47.00
No. z hvy, melting	40.00	to	41.00
No. 1 bundles	46.00	to	
No. 2 bundles	38.00		
Machine shop turn	27.50		18.50
Mixed bor, short turn.	27.50		
Cast fron borings			
Showeling tuesdays	27.50		
Shoveling turnings	80.00		31.00
Clean cast chem. borings	27.00		
Low phos. 5 ft and under.	48.00		
Low phos. 2 ft and under.	49.00	to	50.00
Low phos. punch'gs	49.00	to	50.00
Elec, furnace bundles	47.00	to	48.00
Heavy turnings	43.00		
RR. steel wheels	49.00		
RR. spring steel	49.00		
Rails 18 in. and under			
Cupole cost	62.00		
Cupola cast.	36.00		
Heavy breakable cast	44.00		
Cast iron car wheels	49,00		
Malleable	50.00	to	51.00
Unstripped motor blocks	28.00	to	30.00
No. 1 machinery cast	46.00		
The same of the sa		200	-1100

Cleveland

No. 1 hvy. melting \$	43.50	to	\$44.50
No. 2 hvy, melting	38.00	to	89.00
No. 1 bundles	43.60		
No. 2 bundles	35.00		
No. 1 busheling	43,50		
Machine shop turn	84.00		
Mixed bor, and turn	27.00		
Shoveling turnings	27.00		
Cast iron borings			
Cut structivil & plates 0 st	27.00	to	28.00
Cut struct'r'l & plates, 3 ft			
& under	49.00		
Drop forge flashings	48.00		
Low phos. punch'gs, plate.	44.00		
Foundry steel, 2 ft & under	48.00	to	49.00
No. 1 RR. heavy melting	44.50	to	45.50
Rails 2 ft and under	63,00	to	54.00
Rails 18 in. and under	54.00	to	55.00
Railroad grate bars	36,00	to	27.00
Steel axle turnings	29.00	to	30.00
Railroad cast	49.00	to	50.00
No. 1 machinery oast	49.00		
Stove plate	45.00		
Malleable	49.00		

Iron and Steel Scrap

Going prices of Iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting							. 8	46.00	to	\$47.00
No. 2 hvy. melting		2	*					41.00	to	42.00
No. 1 bundles	*	į,	ì			*	. 1	46.00		47.00
No. 2 bundles				ç	ò	ü	. 1	39.00	to	40.00
Machine shop turn.			*					24.00	to	25.00
Shoveling turnings								29.00	to	30.00
Cast iron borings .		,	í	Ç	į.	ī	. 1	29.00	to	30.90
Low phos. plate			*		ì	,		46.00	to	47.00
								46.00	to	47.00

Buffalo

	00. 00. 00.
No. 2 hvy. melting 36.00 to 37	00. 00. 00.
No. 1 husheling 39.00 to 46	.00
No. 1 bundles 39.00 to 40	nn
No. 2 bundles 33.00 to 34	0.00
Machine shop turn 27.00 to 28	.00
Mixed bor, and turn 29,00 to 30	.00
Shoveling turnings 20.00 to 31	.00
Cast iron borings 29.00 to 36	00.0
Low phos. plate 45.00 to 46	00.
Scrap rails, random lgth 47.00 to 41	1.00
Rails 2 ft and under 52.00 to 51	00.
RR. steel wheels 48,00 to 49	00.0
	00.0
	00.0
	1.00
No. 1 cupola cast 40.00 to 4	1.00

Detroit

Brokers buying prices per gro	es ton,	OR CRES:
No. 1 hvy. melting	138.00 t	0 \$39.00
No. 3 hvy. melting	29,00 t	0 30.00
No. 1 bundles, openhearth.	38.00 t	0 29.00
No. 2 bundles	25.00 t	0 26.00
New busheling	38,00 t	0 39.00
Drop forge flashings	37.50 t	0 38.50
Machine shop turn	21.00 t	0 22.00
Mixed bor, and turn,	23.00 t	0 24.00
Shoveling turnings	23.00 t	0 24.00
Cast iron borings	23,00 t	0 24.00
Low phos. punch'gs, plate.	28.00 t	0 39.00
No. 1 cupola cast	39.00 1	0 40.00
Heavy breakable cast	32.00 t	0 33.00
Stove plate	34.00 t	0 35.00
Automotive cast	.42.00 t	0 43.00

St. Louis

No. 1 hvy. melting	 \$36.50	to	\$37.50
No. 2 hvy. melting	34.00	to	35.00
No. 1 bundles	 36.50	to	37.56
No. 2 bundles	29.50	to	30.50
Machine shop turn	23.00	to	24.00
Cast iron borings	27.00	to	28.00
Shoveling turnings	27.00	to	28.00
No. 1 RR, hvy, melting	42.00	to	43.00
Rails, random lengths	46.00	to	47.04
Rails, 18 in, and under	51.00	to	52.00
Locomotive tires uncut		to	43.00
Angles and splice bars .		to	44.00
Std. steel car axles	45.00	to	46.00
RR, specialties	45.00	to	46.0
Cupola cast		to	47.0
Heavy breakable cast.	 35,00	to	26.0
Cast Iron brake shoes .		to	28.00
Stove plate		to	39.0
Cast iron car wheels		to	43.0
Malleable		to	48.5
Unstripped motor blocks		to	39.5

Boston

Brokers buying prices per group	
No. 1 hvy. melting	35.00 to \$36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	25,00 to 26,50
No. 1 busheling	35.00 to 36.00
blec. furnace, \$ ft & under	36.00 to . 87.00
Machine shop turn	17.50 to 18.50
Mixed bor, and short turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Clean cast chem, borings	18.00 to 19.00
No. 1 machinery cast	31.00 to 33.00
Mixed cupola cast,	29.00 to 30.00
Heavy breakable cast	31.00 to 32.00
Stove plate	28.00 to 29.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gro-		
No. 1 hvy. melting	40.50 to	41.50
No. 2 hvy. melting	35.00 to	36.00
No. 2 bundles	31,00 to	32.00
Machine shop turn	18.00 to	19.00
Mixed bor, and turn.	20,00 to	21.00
Shoveling turnings	21.00 to	22.00
Clean cast chem. borings	21.00 to	22.00
No. 1 machinery cast	37.00 to	38.00
Mixed yard cast,	32.00 to	33.00
Charging box cast	36.00 to	37.00
Heavy breakable cast	36.00 to	37.00
Unstripped motor blocks	24.00 to	25.00

Birmingham

No. 1 hvy. melting	32.00	to	\$33.00
No. 2 hvy, melting	28.00	to	29.00
No. 1 bundles	32.00	to	33.00
No. 2 bundles	24.00	to	25.00
No. 1 busheling	32.00	to	33.00
Machine shop turn	19.00	to	20.00
Shoveling turnings	25.00	to	26.00
Cast iron borings	15.00		
Electric furnace bundles	34.00	to	35.00
Bar crops and plate	40.00		
Structural and plate, 2 ft	39.00		
No. 1 RR, hvy, melting	38.00	to	39.00
Scrap rails, random lgth	45.00		
Rails, 18 in. and under	50.00		
Angles & splice bars	45.00	to	46.00
Rerolling rails	53.00	to	54.00
No. 1 cupola cast.	46.00		
Stove plate	43.00		
Charging box cast	27.00		
Cast iron car wheels	36.00		
Unstripped motor blocks	35.00		
Mashed tin cans.	15.00		
Management State Committee 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		-	

Cincinnati

Brokers buying prices per grou	s ton, on	cars:
No. 1 hvy. melting	39.00 to \$	40.00
No. 2 hvy. melting		36.00
No. 1 bundles	39.00 to	40.00
No. 2 bundles		34.00
Machine shop turn		28.00
Mixed bor, and turn		25.00
Shoveling turnings		33.00
Cast iron borings		25.00
Low phos., 18 in. & under		44.00
Rails, random lengths	44.00 to	45.00
Rails, 18 in. and under		52.00
No. 1 cupola cast		45.00
Hvy. breakable cast		39.00
Drop broken cast	49.00 to	50.00

San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy, melting	30.00
No. 1 bundles	32.00
No. 2 bundles	27.00
No. 3 bundles	23.00
Machine shop turn	12.00
Cast iron borings	11.00
No. 1 RR, hvy, melting	32.00
No. 1 cupola cast	45.00

Los Angeles

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 bundles	32.00
No. 2 bundles	25.00
No. 3 bundles	22.00
Machine shop turn.	10.00
Shoveling turnings	12.00
Cast iron borings	12.00
Elec. furn. 1 ft and under	32.00
No. 1 RR, hvy. melting	32.00 42.00
No. 1 cupola cast	42.00
Seattle	

No. 1 hvy. melting				\$38.50
No. 2 hvy. melting			*	35.50
No. 1 bundles				38,50
No. 2 bundles				32.56
Mixed steel scrap	4			32.50
Bushelings				33.50
Bush., new fact, prep'd	*			36.56
Bush., new fact. unprep'd.				32.50
Machine shop turn	*			16.00
Short steel turn				25.50
Mixed bor. and turn \$	14	.0	o to	17.00
				47.5
Cast scrap				45.0

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MODENA, PENNA. PITTSBURGH, PENNA. ERIE, PENNA.

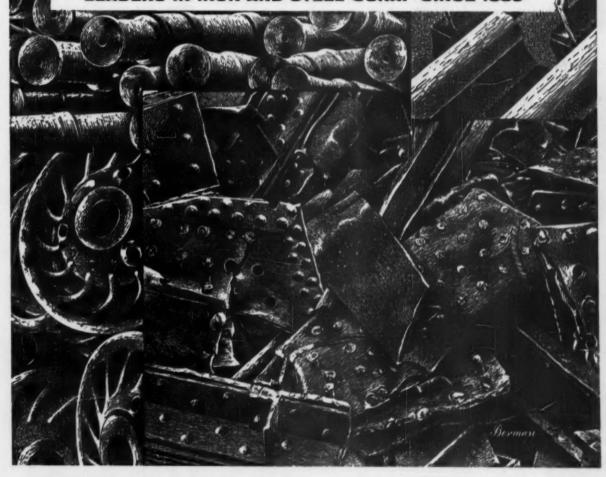


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LEADERS IN IRON AND STEEL SCRAP SINCE 1889



Flood Cripples Brass Output

Raging river damages most of the mills in flooded

Connecticut valley . . . almost 50 pct of industry capacity
affected . . . Cooperative effort expected.

◆ BRASS . . . Brass mills are in a confused and critical situation. A short time ago they were hit hard by a prolonged copper strike. Anaconda was the first to settle its labor difficulties and restart its mining and refining operations. Naturally the brass mill in the least unfavorable supply situation was the Anaconda subsidiary, American Brass. It was just about the only brass organization around with anything that even faintly resembled an adequate supply of copper.

And then the rains came—and they couldn't have come at a worse time. Approximately 50 pct of the nation's brass mills are located in the valley section of Connecticut. The dewy evidence of the hurricane Diane turned the normally placid Naugatuck River into a raging, destructive torrent inflicting severe damage on most of the plants in the area.

The huge Chase plant reported water to the rafters causing damage initially estimated at \$1 million. Clean-up and repair operations may take at least some weeks to return to full production. American Brass has three plants completely shut down, for both shipping and production. At Ansonia, Torrington and Waterbury repair crews are reporting as much as 8 in. of mud on the floor after

water has been pumped out. Scovill reports only slight damage to its main plant but is not operating because gas supply has been cut off for emergency use. The only one of the three that could resume production in a reasonable amount of time is Scovill. The railroad bridge for shipping goods out of town is completely destroyed but an unofficial Scovill spokesman indicated that the organization would truck goods out.

So the situation looks something like this: American Brass has some copper but can't produce in its New England plants. Two organizations with their eastern plants out of the emergency area—Bridgeport and Revere can produce and ship freely—but don't have enough copper. American plants at Buffalo, Detroit and Kenosha are operating at below capacity and certainly could use all of the copper from the crippled eastern plants. But shipping poses a definite expense.

Although no statement has thus far been forthcoming it is probable that American Brass will ship as much of its copper as possible to its western plants. Unofficial sources also hint the possibility that American will seek to farm out some of its urgent contracts along with the necessary copper to local independents.

This will probably set the precedent for the rest of the industry and it is entirely possible that some of the sting might be taken out of the disaster by a cooperative effort within the industry. Most mills have not been running anywhere near capacity anyhow because of the copper shortage.

There were definite indications of a gray market even before the flood. The industry has been warned that such a situation might bring about the return of government controls. However, now that the supply situation has become so critical it is doubtful that the warning will be heeded. Look for a quiet but definite increase in gray market operations for the rest of 1955.

the price of domestic copper jumped 4¢ to 40¢ per lb. Two of the big three have raised their prices, Anaconda Phelps Dodge, with the third member of the triumvirate thus far judiciously abstaining from even making a statement. Actually this is not significant since Kennecott experienced the most labor difficulties and actually could put little copper on the market this week anyhow. They will certainly go along with the competition very soon.

At the same time it was announced that the price of Anaconda's Chilean copper would keep pace with the American variety and also jump to 40¢ per lb. The Chilean government, active in setting the price of the copper mined in its country by the American subsidiaries, has been campaigning for this for some time. The extra income will amount to a \$35.2 million increase in Chile's copper revenues. The Kennecott Chilean subsidiary will no doubt follow suit at the same time as the parent company. The desired effect of the price boost in addition to added revenues is to encourage the import of foreign copper by the United States. Demand so far exceeds supply that supply can never hope to come near catching up without outside assistance.

ANTIMONY . . . Price increases seemed to be in the air as the National Lead Co., leading producer of Antimony announced a price increase of 4½¢ per lb to 33¢ f.o.b. Laredo, Tex. Three factors were cited as cause for the first boost of antimony price since Nov. 1953: 1) shortage of ore, 2) heavier demand and 3) higher labor costs.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Aug. 17	Aug. 18	Aug. 19	Aug. 20	Aug. 22	Aug. 23
Copper, electro, Conn.	36.00	40.00	40.00		40.00	40.00
Copper, Lake, delivered	36.00	36.00	34.00		36.00	36.00
Tin, Straits, New York	96.75	96.375	96.25	96.25	96.00	95.875
Zinc, East St. Louis	12.50	12.50	12.50	12.50	12.50	12.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Nate: Qualations are going prices

*Tentative

MILL PRODUCTS

(Cents per Ib, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

	-	Plate		
Alloy	0.032 in.	0.081 in.	0.136- 0.249 in.	
1100, 3003	40.8	38.7	37.5	36.5
8052 2024-O, -OAL	48.3	43.4	41.7	39.9
7075-O, -OAL	62.6	50.8	48.5	48.6

Magnesium

(F.o.b. mill, freight allowed)

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 59¢; 3/16 in., 40¢; ½ in., 59¢; 0.044 in., 76¢; 0.052 in., 97¢. Specification-grade higher. Base, 30,000 lb.

Extruded Round Red: M, diam ¼ to 0.811 in., 79¢; ½ to % in., \$2.5¢; 1¼ to 1.749 in., 59¢; ½¼ to 5 in., 54.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ½ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extraded Solid Shapes: Rectangles: M. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 67.3¢; 0.22 to 0.25 lb, 5.9 in., 64.3¢; 0.5¢ to 0.59 lb, 8.6 in., 61.7¢; 1.5 to 2.50 lb, 10.5 in., 59.5¢; 4 to 6.5 lb, 28 in., 55¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.30 lb, 2000 lb; 1.90 lb and heavier, 30,000 lb.

Extraded Round Tubing: M. 0.040 to 0.057

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD ½ to 5/16 in., \$1.45; 5/16 to % in., \$1.32; ½ to % in., 90¢; 1 to 2 in., 82¢; 0.165 to 0.219 in. wall: OD. % to % in., 67¢; 1 to 2 in., 62¢; 3 to 4 in., 62¢. Other alloys higher. Base OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

(10,000 is base, 7.0.0. matt)
Sheet and strip, commercially pure, \$14.00\$14.50; alloy \$16.50; Plate, HR, commercially
pure, \$11.50-\$12.00; alloy, \$12.50-\$12.75; Wire,
rolled and/or drawn, commercially pure, \$10.50\$11.60; alloy, \$12.50; Bar, HR or forged, commercially pure, \$8.50-\$8.75; alloy, \$8.50-\$9.00.

Nickel, Monel, Inconel

(Rase prices, f.o.b. mill)

in and b	y		
"A	" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube.	122	108	153
Shot, Blocks		85	* * *

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	56.79		58.86
Copper, h-r	58.76	55.11	
Copper, drawn.		56.36	****
Low brass	58.15	53.09	
Yellow brass .		49.21	****
Red brass		54.48	23.55
Naval brass	52.83	47.14	48.40
Leaded brass		2214	45.74
Com. bronze		56.42	11 ·
Mang. bronse		50.67	52.23
Phos. bronse		77.64	22.11
Munts metal			48.00
Ni silver, 10 pct			68.50
Beryllium coppe		1.9% Be,	150.00
2000 lb, f.o.b.			** **
Strip			\$1.78
Rod, bar, w	CAPE		1.70

PRIMARY METAL

(Cents per lb, unless otherwise noted) Aluminum ingot, 99+%, 10,000 lb,
freight allowed 24.40
Aluminum pig
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be . \$40.00
Beryllium aluminum 5% Be, Dollars
per lb contained Be
Bismuth, ton lots \$2,25
Cadmium, del'd \$1.70 Cobalt, 97-99% (per lb)\$2.60 to \$2.67
Cobalt, 97-99% (per lb) \$3.60 to \$2.67
Copper, electro, Conn. Valley 40.00
Copper, Lake, delivered 36.00
Gold, U. S. Treas., per troy oz\$35.00
Indium, 99.9%, dollars per troy os \$2.25
Iridium, dollars per troy os\$90 to \$100
Lead, St. Louis 14.80
Lead, New York 15.00
Magnesium, 99.8+%, f.o.b. Freeport,
Tex., 10,000 lb, pig 32.50
ingot 33.25
Magnesium, sticks, 100 to 500 lb 53.00
Mercury, dollars per 76-lb flask,
f.o.b. New York\$258 to \$255
Niekel electro 64.50
Nickel oxide sinter, at Copper
Cliff, Ont, contained nickel 69.75
Palladium, dollars per troy oz \$22 to \$24
Platinum, dollars per troy oz \$80 to \$87 Silver, New York, cents per troy oz 90.75
Titanium, sponge, grade A-1 \$3.95 Zinc, East St. Louis
Zinc, New York
Zirconium, sponge\$10.00
Aircontum, sponge

REMELTED METALS

					1	Bi	r	8	81	8	1	B	9	11	bi	ŀ									
(C)	ents	91	161	r		11	b		d	8	24	le	ė	7	8	d		-	Di	0.1	rl	la	a	id	(a)
85-5-5																	-								
No.	115	-		.0								0			0	0									39.75
No.	120																								
No.	123																								
80-10-	10 in	E	ot	Ė																					
No.	305	-								0						0				0					43.00
No.	315																								
\$8-10-	2 ins	ro	t																						
No.	210																		3						58.25
No.	215																								54.2
No.	245																								
Yellow	r ing	ion	6																						
No.	405																								32.75
Mange	nose		bi	n	01	n	y,	a																	
No.	421																								36.7
No.	421		Di	r	01	19.	-																		36.71

Aluminum lagot

(Cents per	to det.d	20,000 10	and over)
95-5 alumin	um-silico	n alloys	
0.30 copp	er max.		.31.25-32.50
0.60 copp	er max.		.31.00-32.25
Piston alloy	rs (No. 1	22 type).	.31.00-32.00
No. 12 alui	m. (No. 1	grade).	.30.00-30.75
			.30.00-30.50
195 alloy			.31.25-32.25
13 alloy (0.	.66 copper	r max.)	. 31.50-32.25
AXS-679			80 00-30 50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade	1-95-9714	%		×	×	8		×		.30.50-31.50
Grade	2-92-95%							0		.29.50-30.50
Grade	3-90-92%					0				28.50-29.50
	4-85-90%									

ELECTROPLATING SUPPLIES

Anodes	
(Cents per lb, freight allowed, 5000 I	b lota)
Copper Cast, oval, 15 in. or longer Electrodeposited Brass, 80-20	50.92 43.28
Cast, oval, 15 in. or longer Zinc, flat cast Ball, anodes	55.00 20.25 19.00
Nickel, 99 pct plus Cast Cadmium Silver 999 fine, rolled, 100 os. lots	98.50 \$1.70
per troy og., f.o.b. Bridgeport, Conn.	941/
Chemicals	

Chemicals	
(Cents per lb, f.o.b. shipping point	
Copper cyanide, 100 lb drum	76.00
Copper sulphate, 99.5 crystals, bbl.	13.75
Nickel salts, single or double, 4-100	
lb bags, frt. allowed	31.25
Nickel chloride, 200 to 400 lb.	43.50
Silver cyanide, 100 oz. lots, per oz.	81%
Sodium cyanide, 96 pct domestic	
200 lb drums	19.80
Zinc cyanide, 100 lb drum	54.30

SCRAP METALS Brass Mill Scrap

	pound, add 1¢ ps of 20,000 lb and Heavy	
Copper Yellow brass Red brass Comm. brons	28 1/4 33 %	3734 26 32% 34
Mang. bronze Yellow braze	261/4	25%

Custom Smelters Scrap

(Conts per pe	to r					tota,	Ocure. on
No. 1 copper	wire	0.0					39 %
No. 2 copper	wire		* *	* *			38
Light copper			8 1		* 1	**.	36
*Refinery bra * Dry coppe					*		0.0

Innet Makers Scrap

(Cents per pour	nd	on	rlo	ad	lot	s, delivered
No. 1 copper w						39
No. 2 copper w						3736
Light copper						85 %
No. 1 compositi						32%
No. 1 comp. tui	mi	ngs		* *		33
Rolled brass						
Brass pipe				* * *		35 14
Rudiktors						20 78
251		BE 1976				101/ 901/
Mixed old cast.	* *	* * *				10 73 - 20 75
Mixed new clips			* *			20 -21
Mixed turnings,	G.	гу	* 1	(B) (B)		19 19 31

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire.	3514-36
No. 2 heavy copper and wire.	3416-36
Light copper	321/2-33
New type shell cuttings	321/233
Auto radiators (unsweated)	
No. 1 composition	28 16-29 14
No. 1 composition turnings	27 1/2 28
Unlined red car boxes	221/6-28
Cocks and faucets	
Mixed heavy yellow brass	
Old rolled brass	
Brass pipe	23 -24
New soft brass clippings	
No. 1 brass rod turnings	22 -224

Alum, pistons and struts 16 1/4-17	
Aluminum crankcases 16 -17	
1100 (28) aluminum clippings 1814-194	į
Old sheet and utensils 16 1/6-17	
Borings and turnings 101/4-11 %	į
Misc. cast aluminum 161/617	
2024 (24s) clippings 171/2-18	

New	siz	ie cli	ppin	gu		×		e -		,		7	1/2	8
Old	gine	3			,	ě.		6 1	 		4	- 6	-	5 36
Zinc														3 76
Old	die	cant	BCFB	(P			*		 		*			3 16

Pure nickel clippings								85	0
Clean nickel turnings			ı.	×	*	,		657	0
Nickel anodes								. 8	0
Nickel rod ends	ï	è		e	'n.		è	8	
New Monel clippings	×	×		×	è	ń		381/2-4	3
Clean Monel turnings	,	ě.		r	*	ĸ	8	2	2 34
Old sheet Monel								3	4 74
Nickel silver clippings,									2
Nickel silver turnings,	1	m	ß.	X	6	Œ		1	5 14

		-	-	_						-
Soft scrap lead										3
Battery plates										7
Batteries, acid	free			÷	e	×	e	- 1		1 76
	Man			. 1						

Segregated solids

Miscellanous

Block tin	11
No. 1 pewter	58 62
Auto babbitt	42 -43
Mixed common babbitt	143
Solder joints	171/2-20
Siphon tops	43
Small foundry type	16
Monotype	15
Lino. and stereotype	14 143
Electrotype	13 12
Hand picked type shells	105
Lino. and stereo. dross	63
Electro dross	4.5

	STEEL	DILLE					SHAPES		. mill, in cents	per Mi., gentees	etterwise so	ted. Extra	перету.	
	PRICES		TS, BLO SLABS	OMS,	PIL- ING		UCTUR				STR	P		
A	(Mfootive ug. 28, 1955)	Carbon Rerolling Not Ton	Carbon Forging Net Ton	Alloy Not Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- relled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- relied	Alloy Cold- rulled
	Bethlehem, Pa.			\$96.00 B3		4.65 B3	6.80 B3	4.65 B3						
	Boffelo, N. T.	\$68.50 B3	\$84.50 RJ, BJ	\$96.00 RJ, BJ	5.45 B3	4.45 B3	6.86 B3	4.45 B3	4.325 R3,B3	6.25 RJ, S10	6.425 B3	9.125 B3		
	Cisyment, Dei.	100												
	Harrison, N. J.													13.45 CI
	Conshohocken, Pa.								4.375 AZ	6.30 /42	6.425 AZ			
	New Bedford, Mass.									6.70 R6				
EAST	Johnstown, Pa.	\$48.50 B3	\$84.50 B3	\$96.00 BJ		4.65 B3	6.00 B3							
-	Boston, Mass.									6.60 78				13.80 T8
	New Haren, Conn.									6,78 D1 7.00 A5				
	Phoenizville, Pa.		-			5.15 P2		5.15 P2						
	Sporrows Pt., Md.	-							4.325-83	6.25 B3	6.425 B3	9.125 B3		
	Bridgoport, Wallingford, Conn.	*** ***	*** ** ***	-										
	Pawwekat, R. L.	\$73.50 NB	\$89.50 N8						4.625 N8	6.90 W7			7.56 NB	
	Warcester, Mass.									7.10 A5				13.80 N7
	Alton, III.	,	majoriose see con con						4.50 L1					
	Ashland, Ky.								4.325 A/					
	Canton-Mussillon, Dover, Ohio		\$86.50 R3	\$96.00 AU										13.45 G#
	Checago, III.	\$68.50 UI	\$84.50 R3, UI,W8	\$96.00 R3, UI,W8	5.45 UI	4.60 UI, W8	6.75 UI, YI	4.60 UI	4.325 A1, N4,W8	6.35 A1,78			7.26 19/8	13.45 78
	Clereland, Ohio									8.25 A5, J3		9.30 45		13.45 A
	Datroit, Mich.			\$96.00 R5					4.425 G3,M3	6.35 DI,D2. G3,M2,P11	6.525 GJ	9.29 D2. G3		
	Duluth, Minn.					-			-					
WEST	Gary, Ind. Harbor, Indiana	\$65.50 U1	\$84.50 UI	\$95.00 UI, YI	5.45 /3	4.60 UI,	6.75 UI, 13		4.325 /3, UI, YI	6.35 /5 6.25 Y/	6.425 /1, UI, YI	9.30 Y/	1.20 YI, UI	
MIDDLE	Starling, 18.		-				-	-	4.425 N4				-	
DIM	Indianapolis, Ind.			-	-	-	-	-		6.40 C5			-	
	Namperi, Ky.	-	-		-			-					7.20 NS	
	Middletown, Oble				-					8.45 A7				-
	Niles, Warren, Ohio Sharon, Pa.	\$68.50 C10	\$84.50 C/O	396.00 C10			-		4.325 SI, R3	6.25 SI, R3,76	6.425 SI, RJ	9.10 SI, RJ	7.20 SI	13.45 S/
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$68.50 UI, J3	\$84.50 /3, UI,CII	\$96,89 UI, CII	5.45 UI	4.60 UI, J3	6.78 UI, J3	4.60 UI	4.325 P6	4.25 57,84			7.20 59	13.45 5
	Pertamouth, Ohio				-				4.325 P7	6.25 P7				-
	Weirten, Wheeling, Follansbee, W. Vo.					4.00 W3			4.325 W3	6.25 F 3, W 3	6.425 W1	9.10 W3		
	Youngstown, Ohio		\$84.50 C/O	\$96.00 YI. CIO		4.60 Y/	6.75 YI		4.325 UI, YI	626 YI,CS	4.425 UI. YI	9.30 Y/	7.20 UI. YI	13.45 C
	Fontane, Cal.	\$76.00 K1	\$92.00 K/	\$115.00 K	7	5.25 K/	7.40 KI	5.40 K/	5.075 K1	8.00 Ki	7.525 K/	-	8.85 KI	-
	Genera, Utah		\$84.50 C7			4.60 C7	6.75 C7							
	Kansas City, Ma.					4.70 57	6.85 52				6.675 52		7.45 52	
-	Los Angelos, Torranco, Cal.		\$94.00 B2	\$116.00 B	12	5.30 C7, B2	7.45 B2		5.075 C7, B2	8.30 CI			8.40 82	
WEST	Minneque, Colo.					4.90 C6			5.425 C6					
	Portland, Ore.	-			***************************************	5.35 02								
	San Francisco, Nilva. Pirtaburg, Cal.		\$94.00 B2			5.25 B2 P9	7.40 B2		5.075 B2, C7					
	Sastile, Wash.		\$98.00 B2		-	5.35 B2	7.50 B2		5.325 B2					
	Atlanta, Ga.								4.525 .48					-
SOUTH	Fairfield, Ala. Ciry, Birmingham, Ala.	\$69,50 72	\$84.50 72			4 60 C/6, R3, T2	6 75 72		4.325 R3, C16,T2		6.425 77			
20	Houston, Lone Star,	LJ	\$89.50 52	\$101.00 5	2	4.70 52	6.85 52				8.675 52		7.45 .52	

	RON AGE		Ralics id	entily produc	ers listed in	key at end o	d table. Bas	e prices, Lo.b	, mill, in on	no bes gr" o	nissa etherwi	e neted. Eat	tras apply.	
	PRICES					SHEETS					WIRE ROD	TINP	LATE	BLACE
A	(Effective ing. 23, 1988)	Hot-rolled /8 ga. & hvyr.	Cold- rolled	Galvanized 10 ga.	Enamel- ing /2 ga.	Long Torne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- relled 19 gs.		Cakes* /.25-lb. base box	Electro* 0.25-lb, base box	Hollowwar Enameling 29 ga.
	Bethlebern, Pa.													
	Buffale, N. Y.	4.325 B3	5.325 <i>B</i> 3				6.375 B3	7.875 B3			PF6	† Special es terns deduct 1.25-lb cake	sated mig. 95¢ tram	
	Claymont, Del.											price. Can-m	saking quality	
	Contesville, Pa.											deduct \$2.20	saking quality 5 to 128 lb. 1 from 1.25-lb.	
	Censhehecken, Pa.	4.375 A2	5.375 A2				6.425 A2					* COKES:	1.50-lb.	
	Harrisburg, Pu.											ELECTRO	0.50-lb. add	
LAST	Hartford, Conn.											1.66-lb. add untial 1,00 I	add 65¢; \$1.10. Differ-	
2	Johnstown, Pa.										5.025 B3	add 65¢.		
	Fairless, Pa.	4.375 UI	5.375 UI				6.425 UI	7.925 UI				98.40 UI	\$7.00 UI	
	New Haven, Conn.													
	Phoenizville, Pa.													
	Sparrows Pt., Md.	4.325 B3	5.325 B3	5.85 B3			6.375 B3	7.875 B3	8.00 B3		5.125 B3	\$8.90 B3	\$7.60 B3	
	Worcester, Mass.										5.325 A5			
	Trenton, N. J.			-										-
_	Alton, III.										5.20 LJ			
	Ashland, Ky.	4.325 A7		5.85 A7	5.90 .47									
	Canton-Massillan, Dover, Ohio			5.85 RI, R3										
	Chicago, Joliot, III.	4.325 AI,		- KO			6.375 UI				5.025 A5,			
		Wil									N4,R3			
	Sterling, III.										5.125 N4			
	Cleveland, Ohio	4.325 J3, R3	\$.325 /3, RJ		5.90 R3		6.375 J3, R3	7.675 J3, R3			5.025 A5			
	Detroit, Mich.	4.425 G3, M2	5.425 G3, 5.325 M2				6.475 G3	7.975 G3						
_	Newport, Ky.	4.325 NS	5.325 N5	5.85 N5										
E WEST	Gary, Ind. Harber, Indiana	4.325 /3, UI, YI	8.325 /3, UI, YI	5.85 UI, 13	8.90 UI, 13	6.25 UI	6.378 YI, UI,I3	7.875 UI, YI			8.025 Y/	\$8.80 /3, UI, YI	\$7.50 13, UI, YI	6.68 UI. YI
MIDDLE	Granita City, III.	4.525 G2	5.525 G2	6.85 G2	6.10 GZ								\$7.60 G2	6.75 G2
Z	Kokomo, Ind.	4.425 C9		5.95 C9				-		8.475 C9	8.125 C9			
	Manefield, Ohio	4.325 E2	5.325 E2			6.25 E2		-		E2				
	Middletown, Ohio		5.325 A7	5.85 A7	5.90 A7	6.25 A7								
	Niles, Warren, Ohio Sharon, Pa	4.325.S1, R3 N3	5.325 R3 N3	6.85 N3, R3	5.90 N3	6.25 N3	6.3785/, R	7.875 R3				\$8.00 AJ	\$7.50 R3,	
	Pittaburgh, Pa. Midland, Pa. Butler, Pa.	4.325 /3, U1,76	5.325 /3. UI, P6	5.85 UI	5.90 UI, A7		6.375 J3, UI	7.875 UI	8.60 UI		5.025 AS P6	98.90 J3,	\$7.50 /3, UI	6.65 UI
	Pertsmouth, Ohio	4.325 P7	5.325 P7								5.825 P7			
	Weirton, Wheeling, Fellansbee, W. Va.	4.325 W3.	\$.32\$ W3, W5,F3	S.85 W3, W5		6.25 W3,	6.375 W3	7.875 9/3				98.80 W3, 1875	\$7.50 W3,	6.45 F3, W5
	Fellansbee, W. Va. Toungstown, Ohio	4.325 UI,	8.325 YI	10'5	5.90 Y/	W5	6.378 UI,	7.875 YI			5.825 Y/	1075	14/5	14.5
		YI					YI							
	Fontana, Cal.	5.075 K/	6.425 KI	-			7.125 KI	8.975 K1	-					-
	Genera, Utah	4.425 C7		-			-		-		5 mm m			
	Kansus City, Ma. Los Angelos,				-	-					5.275 37 5.825 87			-
WEST	Yorrance, Cal.				-									
	Minnequa, Cola.	5.825 C7	6.275 C7	6.60 C7	-	-	-		-		5.275 CS 5.875 C7	99.55 C7	\$8.25°C7	-
	San Francisco, Niles, Pitteburg, Cal. Seattle, Wash			-		-			-	-	-	11.20	1	-
-	Atlanta, Ga.							-					-	-
SOUTH	Fairfield, Ala. Alabama City, Ala.	4.325 R3, 77	5.325 72	5.85 RJ, 72			6.375 72			5.425 R3	5.825 R3,	\$8.99 77	\$7.60 T2	
36	Houston, Tox.										5.275 .52			

	RON AGE		Italics identify	producers listed	in key at end o	i table. Base ;	prices, f.o.b. mi	ill, in cents per l	b., unless oth	erwise sotad. I	Extras apply.	
	PRICES			ВА	RS				PLA	TES		WIRE
1	(Bfactive lug. 28, 1985)	Carbon Steel	Reinfort.	Cold Fireighand	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carlon Steel	Fluor Plats	Alloy	Hi Str. Low Alloy	Mir's. Bright
	Bethlehom, Pa.				5.575 B3	7.425 Hi	6.60 B)					
	Bullalo, N. Y.	4.45 B3,R3	4.45 B3,R3	5.95 B5	5.575 B3, R3,	7.425 B3, B5	6.80 B3	4.50 B3,R3				6.25 IV6
	Claymont, Del.							4.90 Cf		6.20 C#		
	Contesville, Pa.							4.50 L4		6.30 L4	6.725 L4	
	Combohocken, Ps.							4.50 A2	5.575 A2		6.725 A2	
	Harrisburg, Pa.							5.10 C3	5.575 C3			
	Hartford, Conn.			6.40 R3		7.726 R3						
EAST	Johnstown, Pa.	4.45 #3	4.65 B3		5.575 B3		6.80 B3	4.50 B3		6.30 B3	6.725 B3	4.25 B3
2	Fairless, Ps.	4.80 UI	4.89 UI		5.725 UI							
	Newark, N. J.			6.35 W/II		7.00 IV/0						
	Camdon, N. J.			6.35 P/0								
	Bridgoport, Putnam, Conn.	4.80 NS		6.45 W10	5.725 NB			4.750 NB				
	Sparrows Pt., Md.		4.45 B3					4.50 B3		6.30 B3	6.725 B3	4.35 B3
	Palmer, Wereaster, Readville, Manefield, Mass.			6.35 W// 6.45 B5,C/4		7.725 A5,B5		4.50 AU				6.55 A5, W6
	Alten, III.	4.85 L1			,							6.425 L1
	Ashland, Newport, Ky.		-					4.50 A7.N5		6.20 N5		
	Centon-Massiffon, Manufold, Ohio	4.75 RJ		5.90 R2,RJ	5.875 R3, T5	7.425 R2,R3, T3		4.50 E2				
	Chicago, Jolist, III.	4.45 UI, N4,W8,R3, P13	4.65 N4,R3, P/3	8.90 A5,W10, W8,B5,L2	5.875 UI, R3, 1978	7.425 A5,W8, W10,L2,B5		4.50 UI,W8, I3,AI,R3	8.875 UI	6.30 UI	6.725 UI	6.25 A5, R3,N4,
	Cleveland, Ohio	4.85 RJ	4.45 R3	5.90 A5,C13		1.425 A5,C13	6.80 R3	4.60 /3, R3	5.575 <i>]</i> 3		6.725 R3, J3	6.25 A5, C/3
	Batroit, Mich.	4.78 G3	4.75 GJ	5.89 R5 6.10 B5,P8 6.15 P3	5.575 AU 5.478 GJ	7.425 R5 7.625 B5,P3 P8	6.90 GJ	4.60 G3			6.835 G3	
WEST	Dubath, Minn.											6.25 A5
HIDOUR &	Gary, Ind. Harbor, Crawfordaville	4.65 13, UI, YI	4.65 /3, UI, YI	\$.90 M5,R3	5.575 /3, UI, YI	7.425 MS, R3	6.80 UI,I3, YI	4.50 /3. UI,YI	5.575 /3	6.30 UI, YI	6.725 UI,13. YI	6.35 M4
Ē	Granite City, III.							4.70 G3				
	Kehomo, Ind.	-										6.35 C9
	Sterling, Ell.	4.75 No	4.75 N4									6.35 No
	Niles, Warren, Ohio Sharen, Pa.	4.65 R3,C10		5.90 C10	8.875 C/0	7.425 C/0	6.80 R3	4.50 S1,R3		6.30 SI	6.725 SI	
	Pittsburgh, Pa. Midland, Pa.	4.65 /3, UI, CII	4.46 J3, UI	\$.90 A5.C8, C11,J5, W10,84,R3	\$.57\$ UI,CII	7.425 A5,C11, W10,C8,R3	6.90 J3, UI	4.80 J3, U1	5.575 UI	6.30 UI	6.725 J3, UI	6.25 AS.,
	Portsmouth, Ohio											6.25 P7
	Weirton, Wheeling, Foliansboo, W. Va.	4.45 W3						4.50 W3,W5				
	Youngstown, Ohio	4.45 UI, YI, C10,R3	4.45 UI, VI, R3	5.90 YI, UI	5.575 UI, YI, CIO	7.425 Y1,C16 7.465 F2	6.80 UI, YI	4.50 UJ, YI, R3		6.30 YI	6.725 YI	6.25 Y/
	Emeryville, Cul.	5.40 /5	5.40 Ji									
	Fentens, Cel.	5.35 K1	5.35 K1		6.625 K1		7.50 KI	5.825 KI		6.95 KI	7.375 K/	
	Geneva, Utah							4.50 C7			6.725 C7	
	Kenses City, Mo.	4.90 S2	4.90 S2		5.825 S2		7.05 52					6.50 .52
WEST	Les Angeles, Torranco, Cal.	5.35 M2,C7	5.35 B2,C7	7.35 RJ	6,625 B2		7.50 B2				7.625 B2	7.20 B2
	Minneque, Cala.	5.10 C6	5.10 C6					5.35 C6				6.50 C6
	Portland, Ore.	5.40 02	5.40 02									
	San Francisco, Nilos, Pittoburg, Cal.	5.35 C7 5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 82					7.20 C7
	Seattin, Wash.	5.40 B2,P12, N6	5.40 B2,P12				7.55 82	5.40 B2		7.28 R2	7.625 B2	
	Atlanta, Ga.	4.85 /48	4.85 .48									6.45 .48
SOUTH	Fairfield, Alo. City, Birmingham, Ala.	4.65 T2,C16, R3	4.65 T2,C/6, R3				6.80 72	4.50 72,R3			6.725 772	6.25 R3, 72
26	Houston, Ft. Worth, Lone Star, Tex.	4.90 .52	4.90 52		5.825 .52		7.85 52	4.60 L1, SZ		6.40 52	6.825 SZ	6.50 .52

Key to Steel Producers

With Principal Offices

- Al Acme Steel Co., Chicago Al Alan Wood Steel Co., Conshehocken, Pa.
- AS Allegheny Ludlum Steel Corp., Pittsburgh 40
- American Cladmetals Co., Carnegie, Pa. 45
- American Steel & Wire Div., Cleveland
- Angell Nail & Chaplet Co., Cleveland Armco Steel Corp., Middletown, O.
- Atlantic Steel Co., Atlanta, Ga. 48
- Babcack & Wilcox Tube Div., Beaver Falls, Pa.
- Bethlehem Pacific Coast Steel Corp., San Francisco **B**2
- Bethlehem Steel Co., Bethlehem, Pa. BI
- Blair Strip Steel Co., New Castle, Pa.
- Bliss & Laughlin, Inc., Harvey, Ill. Brook Plant, Wickwire Spencer Steel Div., Birdeboro, Pa.
- Calstrip Steel Corp., Los Angeles
- C ter Steel Co., Reading, Pa.
- CI Central from & Steel Co., Harrisburg, Pa.
- Claymont Products Dept., Claymont, Del. Ci
- Cold Metal Products Co., Youngstown, O. C
- Colorado Fuel & Iron Corp., Denver C7
- Columbia Geneva Steel Div., San Francia C8 Columbia Steel & Shafting Co., Pittsburgh
- C9 Continental Steel Corp., Kokomo, Ind. C10 Copperweld Steel Co., Pittsburgh, Pa. C11 Crucible Steel Co. of America, Pittsbur

- C12 Cumberland Steel Co., Cumberland, Md.
- C13 Cuyahoga Steel & Wire Co., Cleveland
- C14 Compressed Steal Shafting Co., Readville, Mass. C15 G. O. Carlson, Inc., Thorndale, Pa. C16 Conners Steel Div., Birmingham
- C17 Chester Blast Furnace Inc., Chester, Pa.
- DI Detroit Steel Corp., Detroit Detroit Tube & Steel Div., Detroit D2
- D3
- Driver Harris Co., Harrison, N. J. Dickson Weatherproof Nail Co., Evanston, Ill. Henry Diaston & Sons, Inc., Philadelphia
- DS
- Eastern Stainless Steel Corp., Baltimore
- E2 Empire Steel Co., Manufield, O.
- Firth Sterling, Inc., McKeesport, Pa.
- F2 Fitzsimmons Steel Corp., Youngstown
 F3 Follansbee Steel Corp., Follansbee, W. Va.
- GI Globe Iron Co., Jackson, O.

- G2 Granite City Steel Co., Granite City, Ill.
- G9 Great Lakes Steel Corp., Detroit
- G# Greer Steel Co., Dover, O.
- III Hanna Furnace Corp., Detroit
- 12 Ingersoll Steel Div., Chicago
- 13 Island Steel Co., Chicago
- 14 Interlake Iron Corp, Cleveland
- J1 Jackson from & Steel Co., Jackson, O.
- J2 Jessop Steel Corp., Washington, Pa. Jones & Laughlin Steel Corp., Pittsburgh
- Joslyn Mfg. & Supply Co., Chicago
- J3 Judson Steel Corp., Emeryville, Calif.
- KI Kaiser Steel Corp., Fontana, Cal.
- K2 Keystone Steel & Wire Co., Peeria
- K3 Koppers Co., Granite City, Ill.
- LI Luciede Steel Co., St. Louis L2 La Salle Strei Co., Chirago
- L3 Lane Star Steel Co., Dallas
- Li Lukena Steel Co., Coatesville, Pa.
- M1 Mahoning Valley Steel Co., Niles, O.
- M2 McLouth Steel Corp., Detroit
- M3 Mercer Tube & Mfg. Co., Sharon, Pa.
- M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
- M5 Monarch Steel Div., Hammond, Ind.
- M6 Mystic Iron Works, Everett, Mass.
- NI National Supply Co., Pittsburgh N2 National Tube Div., Pittsburgh
- N3 Niles Rolling Mill Div., Niles, O.
- Northwestern Steel & Wire Co., Starling, Ill. N4
- NS Newport Steel Corp., Newport, Ky. . N6 Northwest Steel Rolling Mills, Seattle
- N7 Newman Crosby Steel Co., Pawtucket, R. I.
- N8 Northeastern Steel Corp., Bridgeport, Conn.
- 01 Oliver Iron & Steel Co., Pittsburgh 02 Oregon Steel Mills, Portland
- P1 Page Steel & Wire Div., Monessen, Pa. P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
- P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
- P# Pittsburgh Coke & Chemical Co., Pittsburgh
- PS Pittsburgh Screw & Bolt Co., Pittsburgh
- P6 Pittsburgh Steel Co., Pittsburgh Portsmouth Div., Detroit Steel Corp., Detroit
- P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J.
- P11 Production Steel Strip Corp., Detroit P12 Pacific Steel Rolling Mills, Seattle
- P13 Phoenix Mfg. Co., Joliet, III.
- RI Reeves Steel & Mig. Co., Dover, O.
- Reliance Div., Eaton Mfg. Co., Massillon, O. **R2**
- Republic Steel Corp., Cleveland Roebling Sons Co., John A., Trenton, N. J.
- BY Rotary Electric Steel Co., Detroit
- 84 Rodney Metals, Inc., New Bodford, Mass.
- Rome Strip Steel Co., Rome, N. Y. R7
- SI Sharon Steel Corp., Sharon, Pa. 53 Sheffield Steel Corp., Kansas City
- S3 Shonango Furnace Co., Pittaburgh
- 34 Simonda Saw & Steel Co., Fitchburg, Mass.
- Sweet's Steel Co., Williamsport, Pa. 25
- Standard Forging Corp., Chicago 56
- 57 Stanley Works, New Britain, Conn.
- Superior Drawn Steel Co., Monaca, Pa. .58
- 59 Superior Steel Corp., Carnegie, Pa.
 S10 Seneca Steel Service, Buffalo
- TI Tonawanda Iron Div., N. Tonawanda, N. Y.
- Tennessee Coal & Iron Div., Fairfield T2
- Tennessee Products & Chem. Corp., Nashville
- 74 Thomas Strip Div., Warren, O.
- TS Timken Steel & Tube Div., Canton, O.
- To Tremont Nail Co., Wareham, Mass.
- Texas Steel Co., Fort Worth
- 78 Thompson Wire Co., Bosto
- Ul United States Steel Corp., Pittsburgh
- Ul Universal-Cyclops Steel Corp., Bridgeville, Pa.
- US Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U. S. Pipe & Foundry Co., Birmingham
- W1 Wallingford Steel Co., Wallingford, Conn.
- W2 Washington Steel Corp., Washington, Pa.
- W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa.
- W5 Wheeling Steel Corp., Wheeling, W. Va. W6 Wickwire Spencer Steel Div., Buffalo
- W7 Wilson Steel & Wire Co., Chicago
- W8 Wisconsin Steel Co., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala.
- W10 Wycoff Steel Co., Pittsburgh WII Worcester Pressed Steel Co., Worcester, Mass.
- VI Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about \$200 per net ton.

							BUTT	WELD										SEAN	ILESS			
	3/4	In.	94	in.	11	in.	134	In.	11/6	In.	2 1	n.	21/2	3 In.	2	la.	2%	in.	3	în.	31/2	4 In.
STANDARD T. & C.	Bik.	Gel.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	BIk.	Gal.	Blk.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.
Sparrows Pt. B3 Georgatown R3 Fondane KI Fittaburgh J5 Alton, III. LI Sharon M3 Fairless N2 Pittaburgh NI Whooling W5 Whooling W5 Georgatown YI mediana Harbor YI Larain N3 Larain N3 Larain N4	15.50 17.50 6.00 17.50 17.50 17.50 17.50 17.50 17.50 17.50 17.50	0.25 0.25 +9.25 2.25 0.25 2.25 2.25 2.25 2.25 2.25 2.25 2.25 2.25 2.25	18.50 20.50 9.00 20.50 18.50 20.50 18.50 20.50 20.50 20.50 20.50 20.50 19.50	4.25 4.25 +5.25 6.25 4.25 6.25 6.25 6.25 6.25 6.25 6.25 6.25 6	21.00 23.00 11.50 23.00 21.00 23.00 23.00 23.00 23.00 23.00 23.00 23.00 23.00	7.75 7.75 +1.75 9.75 7.75 9.75 9.75 9.75 9.75 9.75 9	23.50 25.50 14.00 25.50 23.50 25.50 25.50 25.50 25.50 25.50 25.50 25.50	8.50 9.00 +1.00 10.50 8.50 10.50 10.50 10.50 10.50 9.50	24.00 26.00 14.50 25.00 24.00 26.00 26.00 26.00 26.00 25.00 25.00	9.50 10.00 +0.00 11.50 9.50 11.50 9.50 11.50 11.50 11.50 11.50	24,50 26,50 15,00 26,50 24,50 26,50 26,50 26,50 26,50 26,50 26,50 26,50 26,50 26,50	10.00 10.50 0.50 12.00 10.00 12.00 12.00 12.00 12.00 12.00 12.00	26,00 28,00 16,50 28,00 26,00 28,00 28,00 28,00 28,00 28,00 28,00 28,00 28,00 28,00	9.75 10.75 0.25 11.75 9.75 11.75 11.75 11.75 11.75 11.75 11.75	6.50	+8.50 +8.50	10.50	+6.25 +6.25 +6.25 +6.25	13.00	+3.75	14.50 14.50	+2.2
EXTRA STRONG PLAIN ENDS Sparrowe Pt. B3 oungstewn R3 airleas N2 contain K1 'ittaburgh J3 Alton, III. L1 bharon M3 'ittaburgh N1 Wheating W5 Wheating W5 'voungs.evm V1 indiana Harber V1	28.0 22.0 29.6 10.50 22.00 22.0 22.0 22.0 22.0 22.0 22.0	6.25 6.25 6.25 8.25 8.25 8.25 8.25 8.25 8.25 8.25 8	24,00 26,00 24,00 14,50 26,00 26,00 26,00 26,00 26,00 25,00 25,00 25,00	10.25 10.25 10.25 10.25 12.25 12.25 12.25 12.25 12.25 12.25 12.25 12.25 12.25	26,00 28,00 26,00 16,50 28,00 28,00 28,00 28,00 28,00 28,00 27,00 28,00	13.75	78.50 26.50 17.60 28.56	12, 50 13, 04 12, 50 14, 50 14, 50 14, 50 14, 50 14, 50 14, 50 14, 50 14, 50	17.50		18.80	16.00	28.00 30.00 28.00 18.50 30.00 30.00 30.00 30.00 30.00 30.00 30.00 30.00	14.75	8.00 8.00 8.00	+6.00 +6.00	13.00 13.00	+2.75 +2.75 +2.75 +2.78	15.50 15.50	+0.25 +0.25 +0.25	20,50	4.7

Threads only, buttwald and seasaless 2½ pt higher discount. Plain ends, buttwald and commisses, 3-in. and under, 4½ pt higher discount. Buttwald jobbors discount, 5 pct.

Galvanized discounts based on sinc price range of over 9¢ to 11¢ por 10, East St. Louis. For each 2¢ change in sinc, discounts vary as follows: ½, ½ and 1-in., 2 pt.; 1½, 1½
and 2 in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., sinc price range of over 11¢ to 13¢ would lower discounts; sinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis vinc
price now 12.50¢ par 1b.

MERCHANT WIRE PRODUCTS

RAILS, TRACK SUPPLIES

F.o.b. Mill Conts Per Lb	No. 1 Sed. Rolls	Ught Rails	-	Treek Spikes	Sees like	To Pass	The Part of
Bessemer UI	4.725	5.66	6.825				
Sa. Chicago RJ.				7.96			
Enslay 72	4.725	5.65					
Fairfield 72	11444	5.60	*****	1.99		(5. SES	
Gary UI	4.725	3.60	4.444	4 44	*****	[5. 628 2. 411	
Ind. Harber /3. Johnstown B3.	4,750	g ag	0,623	1,00	*****	2.050	
Joliet UI							
Kanssa Chy SZ			-	7.00	*****		
Kansas City ST. Lackawanna Bi	4.735	5.45	5.825			5.415	
Minnoune Ch	4.725	6.15	15.825	27.98		15.633	182.4
Pittsburgh 01					31.99		12.4
Pitteburgh P5.		****	*****	4.22	****	****	12.4
Pittaburgh /3			*****	7.5	*****	41.44	12.0
Seattle B2	21444	****	4.111	10.00	****	D. 771	125.00
Steelten BJ							
Struthers YI Terrance C7							
Williamsport Si	*****	0.46	*****		*****		
Toungstown RJ.							

ELECTRICAL SHEETS

22-Gags	Hat-Rolled	Colled or Cut Langth)			
F.a.b. Mill Costs Per Lb	(Cut Langths)*	Somi- Processed	Fully Processed		
Pield	8.40 9.35 9.95	8.60 9.60 10.20			
Meter Dyname Trans, 72	10.95 11.85 12.80	11.28 12.10 13.05	11.70 12.60 13.55		
Trans. 65	13.35	Grain Oriented			
Trans. \$8	13.85 14.85	Trans. 80 17.			

sints: Booch Bottom (W5); Brachenridge City (G2); Indiana Harber (13); Mansfeld , Ky. (N5); Nilos, O. (N3); Vandergrift O. (R3); Zanasville (A7).

WARE-									Bas	a prica, i	a.b., del	lars par	100 lb.
HOUSES	Shoots		Strip		Plates	Shapen	Bars		Alloy Bars				
1 646	He-keled	Catebook	38	1	Cale Ralland		1	Het-Refied	32	Hen-Reibed 6615 As reibed	He-Rafled All 100 American	Cald-Draws 6815 As relied	Cold-Draws 6148 Americal
Baltimers\$,10 Birmingham20	7.63 6.70	8, 32 7, 88	8.96- 9.10 9.86	7.65	*****	7.21	7.93	7.61	8.62 9.35	14.38	13.44- 13.96	16.36	16.29
Besten	7.70 6.80	8.81 7.86-	10.27	7.96	10.00	7.80	8.13	7.83	9.53	13.65- 13.80	13.40- 13.45 13.10	16.65	16.50
Chicago 25	6.80	7.93	9.77	7.06		6.99	7.26	7.06	7.75	13.20	12.85	16.65	15.90
Cloreland39	6.60	7.93	8.66	7.18		7.16	7.95	7.32	7.65	13.44	12.91	16.29	15.96
Decree	6.60	8.12	8.78	2.34	8.15	7.27	8.75 7.75	8.96 7.36	9.82	13.40-	13.65	16.25	17.97
Houston	7.86	8.75	9.17	\$.15 7.73		7.66	8.20	8.25 7.75	9.85- 9.95 8.52		14.60		17.00
Las Angeles 10	8.05	10.00	11.60	8,35		8.65	8.30	8.65	11.25		14.25		17.85
Memphis	7.12 5.50	8.02	0.00	7.18	*****	7.31	7.45	7.40	7.94	******	12.94		15.94
New York 18	7.85	8.50	9.44	8.87		7.86	7.85	7.65	9.65		13.28		16.33
Nerfelk	7.28	1.42	9.33	7.65		7.45	7.25	7.65	9,56	13.61	13.16	16,36	16.21
Pittsburgh25 Partland10	6.00 7.80	9.62 7.93 8.80	9.20	7,25 8,00	9.00	6.99 7.75	7.28	7.86	7.85	13.29	12.85	16.65	15.96
Salt Lake City 20		10.60		9.35	*****		9,20	9.15					
San Francisco	8.10	9,05	10,15	8.65	*****	8.20	6.25	8.05	11.70		14.25		17.6
St. Louis 25 St. Paul 25	7.66	8.22	9.19	7.35	11.83	7.28	7.88	7.37	8.14	13.49	13.14	16.35	16.44 16.54

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanised sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanised sheets for quantity. Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) \$.25 delivery. (4) 1000 to 1999 lb. (5) 1000 lb or over. (6) \$.25 delivery. (6) 1000 to 1999 lb. (7) Plus analysis charge.

	Standard & Casted Nails	Woven Wire Fence 9-15½ gs.	"T" Fence Pusts	Single Lesp Bale Ties	Gelv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Whe Galv.
F.a.b. Mili	Cal	Cel	Cel	Cal	Cel	¢/lb.	¢/lb.
Alabama City R3 Alkanipaa, Pa. J3 Alkanipaa, Pa. J3 Altanta A8 Bartenville K2* Bartenville K2* Burlale W5 Chicago, Ill. N4* Cleveland A6 Cleveland A6 Cleveland A5 Crawfordwille M4* Desora, Pa. A5 Duluth A5 Fairfield, Ala. 77 Galvesten D4 Houston S2 Jehnatown, Pa. B3* Jeliet, Ill. A5 Kohomo, Ind. C9 Les Angeles B2* Kansas City S3 Minnequa C6 Meline, Ill. R3 Kohomo, Ill. R3 Pittabough, Cal. C7 Portamouth P7 Rankin, Pa. A5 So. Chicago R3 S. San Francisca C6 Sparrows P1, B3* Strutbers, O, Y1 Warceatur A5 Williamseurt, Pa. S5 Strutbers, O, Y1 Warceatur A5 Williamseurt, Pa. S5	152 154 154 152 157 154 152 152 152 152 157 167 152 157 152 157 152 157 152 157 152 157 152 152 152 152 152 152 152 152 152 152	166 167 162 162 162 179 166 162 164 174 167 162 163 163	162	175 173 173 173 173 173 173 174 178 178 179 171	180 181 179 175 175 175 175 175 175 175 177 180 180 195 175 175 175 175 177	8.35 7.65 7.45 7.40 8.35 7.40 7.40 7.40 8.35 7.50 7.70	7.80 8.025 7.80 7.80 7.80 7.80 7.80 7.80 7.80 7.80

* Galvanised products computed with sinc at 12.5¢ par lb, where indicated. Zinc at 5¢ per lb, far others.

C-R SPRING STEEL

		CARBON CONTENT									
Cents Per Lb F.e.b. Mill			0.61-	0.81- 1.05	1.06-						
Buffalo, N. Y. R7			10.50	12.65							
Carnagia, Pa. S9	** ***			12.65							
Cleveland A5		9.05	10.50	12.65							
Detreit D1 Detreit D2	7.10		10.50	18.10							
Harrison, N. J. CII				12.95							
Indianapolis CS			10.50	12.65							
New Castle, Po. B4	7.64	8.95	10.50	12.65							
New Haven, Conn. D.			10.80	12.95							
Pawtucket, R. I. N7	7.55	9.25	10.80	12.95	15.6						
Pittaburgh S7	7.00	8.95	10.50	12.65	15.3						
Riverdalo, Ill. Al	7.16		16.50		15.3						
Sharon, Pa. Sl	7.00	8,95	10.50	12.65	15.3						
Trenton R4	** ****			******							
Wallingford W1	7.41		10.80	12.95							
Warren, Ohio Tf			10.50	12.65							
Weirton, W. Va. W3.			10.50	*****	112.5						
Worcester, Mass. A5.		9.25	10.50	12.95	15.6						

BOILER TUBES

\$ per 100 ft, carlead	Si	ine	Seas	nless	Elec. Weld		
fals, cut 10 to 24 ft. F.o.b. Mill	OD- In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.	
Rabenck & Wilcox	2 21/2 3 31/2 4	12 12 11	30.87 41.57 47.99 54.03 74.41	49.16 56.76 66.27	46,54 54,34		
National Tube	2 21/2 3 31/2 4	12 12 11	30.87 42.57 47.99 56.03 74.41	49.16 54.76 66.27	46, 54 54, 34		
Pittsburgh Steel	2 21/2 3 31/2 4	13 12 12 11 11	41.57 47.99 56.03	49.16 54.76 66.27			

Miscellaneous Prices

(Effective Aug. 23, 1968)

TOOL STEEL

F.o.b.	m411				
W	Cr	V	Mo	Co	per lb
18	4	1	-	-	\$1.60
18	4	1	-		2.305
18	4	2	-	-	1.765
1.5	4	1.5		-	.96
6	4	3		-	1.36
6	4	2	- 5	-	1.108
High-	-carbon	chromi	um		77
Oil hi	ardened	manga	nese		43
Specia	al carbo	B			31
Extra	carbon				33
Regu	lar carb	on			276
	rehouse				
	pi are			gher.	West of
Missi	ssippi, 6	# high	er.		

CLAD STEEL Base prices, cents per lb, f.a.b.

		Plate	Sheet (12)		
	Cladding	10 pct	15 pet	20 pet	20 pei
	304	30.30	33,15	36.05	32.50
1	316	35.50	38.45	41.40	47.80
Ē	321	32.00	34.85	37.75	37.25
Stainless	347	34.46	37.90	41.40	48.25
ā	405	25.80	29.60	33.35	
	410, 430	25.30	29.10	32.85	

LAKE SUPERIOR ORES

				ent, deliv	
lower		porta.	Prices	effective	for
1000 00	deoun.			-	-

									-	gr.	oss To
Openhearth	lump	0						9 0			\$11.2
Old range,	bessen	901	•							0 0	10.4
Old range,	nonbea	Me	m	101	0		0	0 0			10.2
Mesabi, ber	neemer					0 0		0.0			10.2
Mesabi, nor	n bessen	00		0 1	 0						10.1
High phosp	horus										10.0

COKE

CORE	
Furnace, beehive (f.o.b. oven)	Net-Tor
Connelisville, Pa \$13.00	to \$13.50
Foundry, beehive (f.o.b. oven)	
Connelisville, Pa \$16.00	to \$16.56
Foundry, oven coke	
Buffalo, del'd	\$28.01
Chicago, f.o.b.	
Detroit, f.o.b.	26.20
New England, del'd	26.01
Seaboard, N. J., f.o.b.	24.50
Philadelphia, f.o.b.	24.00
Swedeland, Pa., f.o.b.	24.00
Plainesville, Ohio, f.o.b.	25.50
Erie. Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.50
St. Paul, f.o.b	23.71
8t. Louis, f.o.b	26.00
Birmingham, f.o.b.	22.6
Lone Star, Tex., f.o.b	18.60

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with

G	RAPHITE		CARBON*				
Diam. (in.)	Length (In.)	Price	Diam. (in.)	Langth (In.)	Price		
24 20 16 to 18 14 12 8 to 10 7 8 4 2 21/2	84 72 72 72 72 72 80 80 40 40 40 24	22.00 21.25 21.50 22.00 22.25 22.75 23.00 25.00 30.00 30.75 47.75	45 40 35 30 24 20 17 14 16, 12 8	110 100, 110 110 110 72 to 84 96 72 72 80 60	10.86 9.56 9.56 9.66 9.66 0.86 10.21 11,16		

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Boits

L	Hacoun
Leas Case	C.
% in. & smaller x 4 in. & +5	17
% in. & smaller x 6 in. & shorter	11
shorter+13	10
shorter+16 All diam, longer than 6 in+35	7 net
Rolled thread carriage bolts % in. & smaller x 6 in. and	
shorter	12
Lag. all diam. longer than	18
6 in+11	12
Plow bolts	18

Nuts, H.P., C.P., reg.		Discount
%" or smaller %" to 1%" inclusive 1%" to 1%" inclusive 1%" and larger	Base Discount . 55 . 55 . 57 . 51	Case or Keg 64 63 65 61
C.P. Hox. requior & i %" and smaller %" and larger		64 61
Hot Galv Nuts (all to	rpes)	

%" or smaller 38 . %" to 1%" inclusive... 36 Finished, Semi-finished, Slotted or Cas-

tellated Nut	8							
%" and smaller		0	0		a		5.5	66
%" and larger			0			0	0.3	63

RIVETS	Base per 100 lb
1/2 in. and larger	
7/16 in. and smaller	

New std. hex head, pack- aged 4" thru '4" diam. x 6" and shorter 34 20 9/16 and '8" x 6" and smaller and shorter 31 16 4", '4", '1" x 6" and shorter 8 +11 New std. hex head, bulk* 4" thru '5" diam. x 6"	
New std. hex head, packaged 4" thru 4" diam. x 6" and shorter 34 20 9/15 and %" x 6" and smaller and shorter 31 16 %", ", " x 6" and shorter 8 +11 New std. hex head, bulk*	
and shorter	
9/16. and %" x 6" and smaller and shorter 31 16 %", %", 1" x 6" and shorter 8 +11 New std. hex head, bulk*	
smaller and shorter	
%", %", 1" x 6" and shorter	
shorter	
and shorter 49 41	
9/16" and %" diam. x 6"	
and shorter 48 39	
%", %", 1" x 6" and shorter 31 20	
"Minimum quantity per item: 15,000 pieces ¾", 5/16", ¾" diam. 5,000 pieces 7/16", ¾", 9/16", ¾" dia 2,000 pieces ¾", ¾", 1" diam.	m.

Machine Screws & Stove Bolts

	Diaco	oun?
	Mach. Screws 27	Bolts 88
25,000-200,000	20	61
15,000-100,000	20	61
5,000-100,000		61
	25,000-200,000 15,000-100,000	Mach. Screws ilst 27 list Quantity 25,000-200,000 20 15,000-100,000 20

Machine Screw & Stove Bolt Nuts

Packaged,	package list	Hex	Square
Bulk, bulk		24	27
%-in. diam. & smaller	35,000-200,000	18	20

REFRACTORIES

Fire Clay Brick	Carloads per 1000
First quality, Ill., (except Salina,	Ky., Md., Mo., Ohio, Pa. Pa., add \$5.00) \$132.00
No. 1 Ohio Sec. quality, Pa.,	Md., Ky., Mo., Ill. 114.00
No. I Onio	
Ground fire clay, cept Salina, Pa.	, add \$1.50) 18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala	128.00
Childa, Haya, Pa	133.00
Chicago District	138.00
Western Utah	*****
California	
Super Duty	
Hays, Pa., Athens, Tex., Wind-	
ham	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, East-	
ern (except Hays, Pa.)	31.00
Bilica cement, net ton, bulk, Hays,	
Pa	34.00
Bilica cement, net ton, bulk, Chi-	
cago District, Ensley, Ala	22.00
Silica cement, net ton, bulk, Utah	
and Calif	

Chrome	Bric	k														1	P	61	P	net	ton
Standard Standard	chei	m a K	ic	11	Y	y	b	0	0	d	d	9	d	1	B	B	81	t.			
ner, Ca Burned,	lif.		0 1	 0	0				0	0	0	6				0		9	6	- 9	0.00

Standard Baltimore Chemically bonded, Balti	more \$109.00
--	---------------

Grain Magnesite St. %-in., grains Domestic, f.o.b. Baltimore in bulk fines removed ... \$64.40 Domestic, f.o.b. Chewalah, Wash., Luning, Nev. ... 40.00 in sacks ... 40.00

Dead	Burned	Delomite		Per net ton
F.o.b.	bulk,	producing	points	In: \$15.06
F' H.,	W. VM.	, Onio	Sec.	
201101	West	How.		

METAL POWDERS

Per pound, f.o.b. shipping point, lots, for minus 100 mesh.	in ton
Swedish sponge iron c.i.f.	
New York, ocean bags	11.254
Canadian sponge iron,	9.54
Del'd in East, carloads	110.75#
Domestic sponge iron, 98+% Fe, carload lots	9.54
Electrolytic iron, annealed,	-104
imported 99.5+% Fe domestic 99.5+% Fe	27.54
domestic 99.5+% Fe	36.5∉
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	58.54
Hydrogen reduced fron mi-	00.04
nus 300 mesh, 98+% Fe. 63.0¢	to 80.0#
Carbonyl iron, size 5 to 10	
micron, 98%, 00.8+% Fe88.6¢	to \$1.48
Aluminum	31.54
Brass, 10 ton lots 29.50 to	57.754
Copper, reduced	57.754
Cadmium, 100-199 lb. 954 plus met	al value
Chromium, electrolytic, 99%	
min., and quality, del'd	\$3.60 23.504
Manganese	67.04
Molybdenum, 99%	\$2.75
Nickel, unannealed	89.504
Nickel, annealed	96.604
Nickei, spherical, unannealed	48.504
Solder powder 7.64 to 9.64 pius me	att value
Silicon Solder powder .7.0¢ to 9.0¢ plus me Stainless steel, 303	91.04
Stainless steel, \$16	\$1.10
Stainless steel, 314 Tin	al value
Zine, 10 ton lots	10 25 04
Mine, to ton lone	en wo.34

Ferroalloy Prices

(Effective Aug. 88, 1955)

Ferrockrome Contract prices, cents per lb contained	Spiegoleisen Contract prices, per gross ton, lump,	Alaifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspen- sion Bridge, N. Y., per lb.	
Cr. 2% max 8t.	f.o.b. Palmerton, Pa. Manganese Silicon 16 to 19% 3% max	sion Bridge, N. Y., per 1b. Carloads Ton lots Calcium molybdate, 46.3-46.6%	9.354
6.025% C. 36.00 0.15% C. 22.75 6.025% C. 0.20% C. 32.50 Simplex 34.50 0.50% C. 32.55 6.04% C. 34.50 1.00% C. 32.00 0.10% C. 34.00 2.00% C. 32.75 65-10% Cr. 4-5% C. 3.00% C. 32.75 63-16% Cr. 4-6% C, 6.9% SI 25.60	16 to 19% 3% max. \$84.00 19 to 21% 3% max. \$6.00 21 to 22% 3% max. \$8.50 23 to 25% 3% max. \$1.00	Calcium molybdate, 46.5-46.8% f.o.b. Langeloth, Pa., per pound contained Mo Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered	\$1.38
68-19% Cr, 4-9% C 24.75 68-16% Cr, 4-6% C, 6.9% S1 25.60	Manganese Metal Contract basis, 2 in. x down, cents per	per pound contained Cb. Ton lots	16.90
S. M. Ferrockrome Contract prices, cents per pound, chromism contained, lump size, delivered. High carbon type, 60 k5s.	pound of metal, delivered. 95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe. 45.00 Ton lots 42.50	Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x	6.95
mium contained, iump size, delivered. High carbon type: 60.55%, Cr, 4-6% ii 4-6% Mn, 4-6% C. Carloads	Electrolytic Manganese	D per lb con't Cb plus Ta Perromelybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth,	\$4.65
High Nitrogen Ferrochrome	F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound. Carloads	Pa., per pound contained Mo Ferrophosphorus, electric, 23- 26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage,	\$1.46
Low-carbon type 67-72% Cr. 0.75% N. Add 5¢ per ib to regular low carbon fer- fochrome price schedule. Add 8¢ for each additional 0.35% of N.	Ton lots 32.00 250 to 1999 lb 34.00 Premium for hydrogen - removed metai 0.75	10 tons to less carload\$	\$90.00 110.00
Chromium Motal	Medium Carbon Ferromanganese	0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots,	
Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr. 1% max. Fe. 9.10% max. C \$1.18 0.60% max. C \$1.16 9 to 11% C	Mn 80% to 85%, C 1.25 to 1.50. Contract price, caricads, lump, bulk, delivered, per lb of contained Mn 21.35¢	per lb contained Ti	\$1.35
9 to 11% C 1.25 Lew Carbon Ferrochrome Silicon	Contract price, cents per pound Mn cen- tained, lump size, del'd Mn 85-30%.	Pa., freight allowed, ton itos, per lb contained Ti Less ton lots	\$1.50 \$1.55
(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Nisgara Falls, freight allowed, tump 4-in, x down, 24.75¢ per ib contained Cr plus 12.00¢ per ib contained Si Dults of the contained	Carloads Ton Less	Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, car-	*****
24.75¢ per lb contained Cr plus 12.60¢ per lb contained Al. Bulk 2-in. x down,	0.17% max. C 29.95 31.80 33.80 0.15% max. C 28.45 30.30 31.50 0.30% max. C 26.95 28.80 30.00	Perrotungsten, ¼ x down,	177.00
\$5.05¢ per ib contained Cr plus 10.80¢ per ib contained Si. Buik 1-in. x down, 25.25¢ per ib contained Cr plus 11.00¢ per ib contained Si.	0.07% max. C, 0.06% P, 90% Mn	packed, per pound contained W, ton lots, f.o.b	\$3.80
Calcium-Silicon	Silicomanganese	Pa. bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.27
Contract price per lb of alloy, lump, delivered. 30-32% Cr, 60-65% Bi, 3.00 max. Pe. Carloads 19.00 Ton lots 22.10 Less ton lots 23.60	Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mo, 18-20% SI, 1.5% max. C for 2% max. C, deduct 0.24.	Langeloth, Pa. Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.	\$1.26
Less ton lots 22.10 Calcium-Manganese—Silices	Carload bulk 11.00 Ton lots 12.65 Briquet contract basis carloads, bulk, delivered, per lb of briquet	Carload, bulk lump Ton lots, packed lump Less ton lots, lump packed.	16.75
Contract prices, cents per lb of alloy, lump, delivered. 16-20% Ca, 14-18% Mn, 53-59% Si.	Ton lots, packed	Vanadium Pentoxide, 86 - 89% V ₂ O ₅ contract basis, per pound contained V ₂ O ₆	\$1.28
Carloads	Si 14.01 to 14.50 pct, f.o.b. Keokuk Iowa, or Wenatchee, Wash., \$85.00 gross ton, freight allowed to normal trade area.	of alloy. 35-40%, f.o.b. freight allowed, ton lots	26.00¢
Contract prices, cents per pound of alloy, delivered, 60-65% Bi, 5-7% Mn, 5-7% Zr,	Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$85.00. Add \$1.00 per ton for each additional 0.509 Si up to and including 17%. Add \$1.45 for each 0.50%Mn over	12-15%, del'd, lump, bulk- carloads	
Ton lots	1%. Silicon Metal	Boron Agents Borowil, contract prices per lb of	
V Foundry Alloy	Contract price, cents per pound contained Si, lump size, delivered, packed.	alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Sl, 40-45%, per lb contained 2	\$5.25
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% SI, 8-11% Mn, packed.	96% Si, 2% Fe 20.10 18.00 18.50 18.50	Bortam, f.o.b. Niagara Falls Ton lots, per pound Less ton lots, per pound	45¢ 50¢
8-11% Mn, packed. Carload lots	Silicon Briquets Contract price, cents per pound of briquets, bulk, delivered, 40% 81, 2 lb 81	Less ton lots, per pound Corbortams, Ti 15-21%, B 1-2%, Sl 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Graphidax No. 4	briquets. Carloads, bulk	Ton lots per pound	10.00#
Cents per pound of alloy, f.o.b. Sus- pension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 53%, Ti 9 to 11%, Ca 5 to 7%.	Electric Ferrosilicon	F.o.b. Wash., Pa.; 100 lb up	\$1.20
Carload packed	Contract price, cents per lb contained Bl. lump, bulk, carloads, delivered. 25% Sl 20.00 75% Sl 14.40 50% Sl 12.00 85% Sl 16.10 65% Sl 13.50 90% Sl 17.25	max. C, 1 in., x D, Ton lots F.o.b. Wash., Pa.: 100 lb up 10 to 14% B. 14 to 19% B. 19% min. B. Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over	
Ferromanganese Maximum contract base price, f.o.b., lump sise, base content 74 to 76 pet Mn.	65% 81 13.50 90% 81 17.25 Calcium Metal	No. 1 No. 6 No. 79 Manganese - Boron, 75.00% Mn.	\$1.00 63¢ 50¢
Producing Point Centa per-ib Marietta, Ashtabula, O.; Alloy, W. Va. (Sheffeld, Ala., Perriand)	Eastern sone contract prices, cents per pound of metal, delivered. Cast Turnings Distilled	max. Si, 3.00% max. C, 3 in. x	
Ore. 9.50 Clairton, Pa. 9.50 Sheridan, Pa. 9.50	Ton lots \$2.05 \$2.95 \$2.75 Less ton lots 2.40 3.30 4.55	D, del'd. Ton lots	1.67
Bridge And Carlotte And Carlott	Ferrovanadium 35-55% contract, basis, delivered, per pound, contained V.	Nickel-Boron, 15-13% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd lens ton lots	\$2.05
Carloads, bulk	Openhearth	Silenz, contract basis, delivered.	

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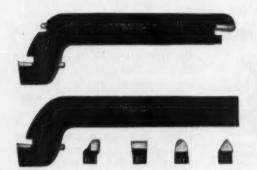
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HOUSE CLEARING

News of Used and Rebuilt Machinery

Ohio Offers Selection . . . Used machinery buyers in northern Ohio will have a far better selection of equipment this fall than in a long time but still not as good as the dealers would like.

After a good first half year saleswise, dealers are using the accumulated funds to scrounge up stocks for the expected fall rush. But they are finding the type of equipment they want just as hard to get as ever.

With the vacation season in full swing and summer's full blast of hot weather, sales are currently spotty with no definite trend apparent. General purpose equipment such as punch presses. tool room equipment and radial drills are the biggest sellers in a slow market but activity is spotty.

Sell Auto Suppliers . . . Best category of customers in this hot auto supplier area continue to be the automotive subcontractors. Their production is at an all-time high. Sheet metal firms are also a leading area market for light fabrication and some radio and appliance components. While most used machinery dealers now have the funds to invest in building up their inventory, good heavy



"I think it's nervous. I shake like that when I get that way."

equipment such as big boring mills, heavy radial drills and boring bars are scarce at any price.

Surplus Models Special . . . Although tons of government surplus equipment are still being sold, dealers find this is specialized equipment built to turn out a specific ordinance or other military jobs at high production

Unless they have a specific customer in mind for the machine. pickings are pretty lean for the dealer. In many cases conversions can be made and accessories added but the cost, time and trouble involved take it out of the "bargain" class.

Toughest salable items to get are heavy shears, press brakes and forming equipment.

Larger metalworking firms are anxious to get these, either to replace worn-out present equipment or to increase the size of jobs they can handle. Purchasing new equipment involves long lead times so used machinery dealers find a steady flow of inquiries.

Look to Chicago . . . In the East as elsewhere, eyes are turning toward the Machine Tool Show and the fall season. Inquiries are holding up fairly well; the mar ket is firm; but talk is more of Chicago hotel reservations and travel schedules.

The Board of Directors of Machinery Dealers' National Assn. will meet during the show at the Drake hotel. Plans are set for the MDNA exhibit. It is expected that the fall business push will get underway at the show as everyone who ever heard of a machine tool will be on hand.

Special conditions pointing to a good fall season are the surprisingly strong summer, the interest generated by the Chicago show and the fact that used machinery will be represented for the first time at the big event.

EMERMAN offers from STOCK

for Sale or Rent



- 4'9" Cinn.-Bickford Super Service Radial Drill, Ser. #IR2735, New 1944
- 4" Sellers Horizontal Table Type Boring Mill, Serial No. 04-1317, New 1942. Over Size Machine. Type A Barber Colman Gear Hobber, Extended bed, Power Down Feed, Serial No. 1363, New 1942
- 6'17" American Hole Wiz. Radial Drill, Ser. #64854, New 1945
- 3¾" Cleveland Model A, Single Spdl. Auto. Screw Machine, Ser. #41748-1043, New 1942
- 10-90 Colonial Model HAS Horiz. Broach, 10-Ton, 90" Stroke, Ser. #M3526-1, New 1943
- 40-Ton LaPointe, Model SRV, Vert. Surface Broach, 66" Stroke, Ser. #43141, New 1943
- 8" Barber Colman, Type V, Vert. Gear Hobber, Ser. #99, New 1946
- No. 645Y Fellows Gear Shaper, 431/2" x 5" Base, Ser. #21503, New 1943
- #24 Gleason Straight Bevel Gear Generator, 351/2" Dia., Ser. #17916, New 1942
- 3B DeVlieg Jig Mill, 3" Bar, Ser. #12-181, New 1951

- 20" x 72" Cinn. Plain Cyl. Grinder, Filmatic Bearings, 84" Centers, Ser. #7B6F1Y-2, New 1952
- 20" x 100" Sidney Engine Lathe, Fluid Tracing Attach., Speeds 15-1000 RPM, Ser. #9372, New 1952
- 241/2" x 28' Monarch Engine Lathe, 2 Carriages, 2 Taper Attachs., Rap. Trav., Ser. #6806, New 1940
- #22B Bardons & Oliver Saddle Type Turret Lathe, 4½"
 Hyd. Bar Feed, Hyd. Pre-Selector Head, Ser. #17013,
 New 1947
- #4 Cinn. Dial Type Univ. Mill, Ser. #4A4U1H-3, New 1940
- 78" Betts Heavy Duty Boring Mill, Complete Electrics. New in 1942
- 36" Rockford Hydraulic Vert. Slotter, Ser. #47-\$1-85, New 1946
- #4 Cinn. Hi-Speed Dial Type Vertical Mill, Ser. #8A4VIK-35, New 1941
- #4 Cinn. Hi-Speed Dial Type Plain Mill, Ser. #4A4P1L-132, New 1943
- 16-44 Cinn. Vert. Hydrotel w/Hyd. Duplicating Attach., Ser. #51M788824-8, New 1951

The above examples of like new machines are but a few available for inspection and offered for sale or rent. While in Chicago, drop in and look over our stock.

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6 ten Northern
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7 Hone Start Hone Start Hone
10 ten PåtH
10 ten Start Hone
10 ten Start
10

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Approx. Work Dia. In-feed, Standard Equip. 1" to 4"

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Press 700 Ton Cap., Bed Aree 60" F. b. x 72"
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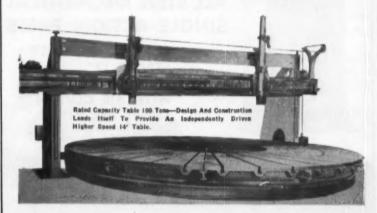
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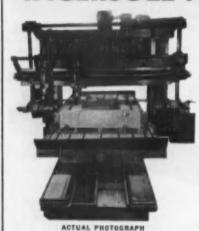


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2	500	Whee,	1300	125/250	2300/440
1	400	Cr. Wh.	1200	125/250	2300/440
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- 2	100	G. E. Whee.	1200	250	2399
A	700	Willer.	200	200	2000
		LARGE	MILL	MOTORS	

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1	1250	G.E.	250/790	600	MCF-6
4	800	Whee.	600	525	Encl.
4	700	Whae.	200/700	250	Encl.
2	600	Al, Ch.	300/600	600	Mill
1	250	Al. Ch.	254/1009	250/375	Mill
			and the second of		

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1	2310	G.B.	MCF	600	400/500
3	1500	What	Rev.	600	600
	1400	9.E.	MCF	666	68/190
- 1	1000	0.E.	MCF	200	250/700
i	940	Whee.	OW	254	140/170
í	800	Whee.		250	450/550
1	690	Al. Ch.		250	400/800
1	599	What.	MCP CO-216	600	800/990
1	500	G.B.	MCF	250	300/900
1	950	Whee.		950	340/990
1	954	G.E.	MPC	230	400/600
i	300	BeL	1970T	230	720
8	200	G.M.	CD-1656E CB-5118	230	500/1500
1	286	Whee,	CB-5118	250	400/800
1	150	9.8	ME	600	259/750
	150	Cr. Wh.	SH-TEFC	220	1100
1	150	Whee.	8K-151B	230	909/1809
i	150	Whee.	BK-201	220	360/950
1	190	G.M.	MCF	230	250/1000
1	135	Whee.	8K-161	230	500/1500
1	135	Whee,	HK-183	299	150
	130	U.M.	MLDH-616	200	419

	M-G	Sets	-3 1	Ph. 60 C	y.
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An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today,

^	Bullato Forge Co 193
	Bullard Co., The90, 91
Abbott Steel Co., Inc 304	Bunting Brass & Bronze Co 234
Accurate Perforating Co 144	*By-Products Steel Co., A Division
"Acme Welding Div. of The United Tool & Die Co 13	of Lukens Steel Co 283
Aetna Ball & Roller Bearing Co., Div. of Parkersburg-Aetna Corp. 60	
Ajax Engineering Corp 4	
*Ajax Flexible Coupling Co 277	c
Ajax Manufacturing Co., The 164	-
Allied Research Products, Inc 190	*Carboloy Dept. of General Elec-
American Broach & Machine Co. 265	tric Go126, 127
*American Pullmax Co., Inc 186	Carborundum Co., Abrasive Div. Between Pages 48, 49
*American Pulverizer Co 256	*Carlton Machine Tool Co58, 59
American Steel Foundries, Elmes Engineering Div 47	Carpenter Steel Co., The Between Pages 48, 49
*American Steel Foundries, King Machine Tool Div98, 99	Chambersburg Engineering Co20, 21
American Zinc Sales Co 152	Chase Brass & Copper Co., Inc 151
*Apex Tool & Cutter Co 297	Chemical Corp II
Applied Research Laboratories 233	Chicago Electric Co 304
Armel, James P 304	Cincinnati Bickford Tool Co., The 54, 55
Armstrong-Blum Manufacturing	Cincinnati Gear Company, The . 270
Co 182 *Armstrong Bros. Tool Co 273	*Cincinnati Gilbert Machine Tool
Arter Grinding Machine Co 10	Co 80
*Atlas Chain & Mfg. Co 191	Cincinnati Milling Machine Co., Grinding Wheels Div 167
Axelson Mfg. Co., Div of	*Cincinnati Shaper Co., The 78, 94, 95
U. S. Industries, Inc180	Cities Service OII Co 100
	Clark Bros. Bolt Co 295
	Clark Controller Co 74
	*Clemson Bros. Inc 271
	*Cleveland Crane & Engineering Co., The Steelweid Machinery
	Co., The Steelweid Machinery Div
	*Cleveland Metal Abrasive Co.,
Babcock & Wilcox Co., The, Refractories Div. Between Pages 262, 263	The
Baird Machine Co., The 235	Co., The 160
*Baldwin-Lima-Hamilton Corp 243	*Collins Microflat Company, Inc. 307
Barber-Colman Company42, 43	Colorado Fuel & Iron Corp., The Wickwire Spancer Steel Div.
Bardons & Oliver, Inc 178	192, 193
Barium Steel Corp 77	Columbia-Geneva Steel Div., United States Steel Corp 255
Barry Controls, Inc 106	
*Bay State Abrasive Products Co. 56, 57	*Conco Engineering Works, Crane & Hoist Div
Belyea Co., Inc 303	Inc 116
Benkart Steel & Supply Co 305	Cowles Tool Co 308
Bennett Machinery Co 364	Crawford, F. H., & Co., Inc 302
Bethiehem Steel Co I	*Cromwell Paper Co 109
Birdsboro Steel Fdry. & Machine	Cross Company, The
Co	Crucible Steel Co. of America., 128
*Boston Gear Works 75	Curry, Albert, & Co., Inc 303
*Brandt, Charles T., Inc 258	
*Brighton Screw & Mfg. Co., The 69	
*Brooks Equipment & Mfg. Co., . 86, 87	
eroots Equipment & Mrg. Co., . 86, 87	

(Continued on Page 308)

Brownell, Hazard, Machine Tools 302

Danly Machine Speciaties, Inc.

Between Pages 16, 17





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ADVERTISERS IN THIS ISSUE

(Continued from Page 307)

Dorien 303	Gishalt Machine Co
Davidson Pipe Co., Inc 384	Gleason Works 135
Denison Engineering Co., The 136, 131	Goodman Electric Machinery Co. 305
*Diamond Machine Tool Co 36	Goss & DeLeeuw Machine Co 310
Donahue Steel Products Co 381	*Gould & Eberhardt, Inc 136
Dony, D. E., Machinery Co 302	Gray, G. A., Company
Dreis & Krump Mfg. Co50, 51	
Du Boot de Namoure E. L. & Co.	Greenlee Bros. & Co 167
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept. Between Pages 16, 17	Greenpoint Iron & Pipe Co., Inc. 304
Batween Pages 16, 17	Grieder Industries, Inc 40
Du Pont de Nemours, E. I., & Co., Inc., Grassell Chemicals Dept. 96	Griffin Manufacturing Co 307
*Dykem Company, The	Gulf Oll Corp
Sylam Company, the	Gulf Refining Co
E	
	н
Eastern Machine Screw Corp., The 309	
Eastern Machinery Co., The 303	Hallden Machine Co., The 241
Eastern Tool & Stamping Co., Inc. 184	*Hansen Manufacturing Co 238
*Eaton Mfg. Co., Reliance Div 121	Harper, H. M., Co., The Between Pages 48, 47
Edlund Machinery Co	Hayward Company, The 307
	The state of the s
*Elastic Stop Nut Corp. of America	Henault, P. A., Co
*Electric Controller & Mfg. Co.,	Hendey Machine, Div. Barber Colman Co
The 132	Hendrick Manufacturing Co 270
Electric Equipment Co 303	Henry, A. T., & Company, Inc 300
*Eigin National Watch Co 144	*Henry & Wright Div. of Emhart
Emerman Machinery Corp 299	
Enterprise Galvanizing Co 306	Higgins, Incorporated 305
Erie Bolt & Nut Co	Hill Acme Co 144
'Eriez Monufacturing Co 108	
Espen-Lucas Machine Works, The 71	
Espen-Lucus muchine works, the 72	Hyman, Joseph, & Sons 302
	Hyman-Michaels Co 385
	riymun-michadis Go.
F	
Fairbanks, Morse & Co	9 1
Falk Machinery Co	H
Ferrel-Birmingham Co., Inc65, 11	
Fate-Root-Heath Co	
*Federal Bearings Co., Inc.	*Interstate Machinery Co., Inc 254
Between Pages 16,	
Federal Machine & Welder Co 2	Tion & dien tradacial management
*Federal Press Co., The	10
Federal Products Corp 2	
Fellows Gear Shaper Co., The 84,	
*Ferracula Machine Co.	
	an J
Ferry Cap & Set Screw Co., The	
Foster, L. B., Co	Jassop Steel Company
Frank, M. K	Between Pages 262, 263
Fuller Co	46 *Jones & Laughlin Steel Corp 171
	Jones Employment
6	
	K
Geiring Tool Co	
*Gallmeyer & Livingston, Inc 2	163 *Kalser Aluminum & Chemical
Gardner Machine Co18,	19 Sales, Inc123, 124,137
General Chemical Div., Allled Chemical & Dye Corp	Kasle Steel Corp 365
Chemical & Dye Corp	III Kearney & Trecker Corp236, 231
	Twe Inon Ace

ADVERTISERS IN THIS ISSUE

*Kempsmith Machine Co 118	*Nations
Kennametal, Inc 112	National
Kinderman, Lou F 300	National
King, Andrew, Co., The 309	National
Kingsbury Machine Tool Corp 61	National
*Kirk & Blum Mfg. Co 232	National
*Kling Bros. Engineering Works., 227	National
Kramer, Andy 306	*Nelson
	Grego
	New Bri
	New Yo
£.	Niagara
	reagara
*L & J Press Corp	Norton
Lamson & Sessions Co., The 141 Land, L. J., Inc	
Landis Machine Co., Inc92, 93	
Landis Tool Co	
Lang Machinery Co 300	
*Lapointe Machine Tool Co., The	
Inside Back Cover	
*LeBland, R. K., Machine Tool Co.,	O'Brien,
TheBetween Pages 64, 65	O'Conne
*Lee, K. O., Co	*Ohio (
Lees-Bradner Co., The	Ohio G
*Link-Belt Co	Ohio St
*Lipe-Rollway Corp 240	*Oliver
Lobdell Div United Engineering	Forqu
Lobdell Div., United Engineering & Foundry Co	Olson I
*Lodge & Shipley Co., The Between Pages 278, 279	
Lowe Bros. Co., The28, 29	
Lucas, J. L., & Son, Inc 102	
Lucas Machine Div., Hew Britain Machine Co., The88, 89	
**Lukens Steel Co 283	
Luria Bros. & Co., Inc 285	*Parker-
	ican
	*Peerles Electr
	Permatt
м	Inc.
MacCaba T B Co	Philade
MacCabe, T. B., Co	Philade
Mackintosh-Hemphill Div. of E.	Platt B
W. Bliss Co 37	Plymout
Macwhyte Company 5	of Th
*Manheim Mfg. & Belting Co 81	*Pope
Master Surgical Instrument Corp. 304	Portage
Mattison Machine Works 134	*Potter ary
Meriwether, George M 302	Niles
Mesta Machine Co	
Michigan Tool Co189, 253	
Micromatic Hone Corp 16	Berne
Miles Machinery Co 301	Purdy
*Millhiser Bag Co., Inc 188	
Minster Machine Co., The 71	
Monarch Machine Tool Co 17	
Morrison Railway Supply Corp 305	
Motch & Merryweather Machinery Co. 8	
	1
	Rail &
	*Red
	Ren-ite
N	*Reput

*National Airoil Burner Co 246
National Automatic Tool Co 129
National Broach & Machine Co 120
National Business Bourse, Inc 306
National Machinery Co 122
National Machinery Exchange 300
National Steel Corp #7
*Nelson Stud Welding Div. of Gregory Industries, Inc228, 229
New Britain Machine Co., The .88, 89
New York & New Jersey Lubri- cant Co
Niagara Machine & Tool Works 82, 83
Norton Co., Machine Div162, 103

Clarence J. 304 ell Machinery Co. 303 Crankshaft Co., The...... 117 Sear Co. 261 teel Foundry Co. 174 Manufacturing Co. 295

P

O

*Parker-Kalon Div., General American Transportation Corp66, 67
*Peerless Electric Co., The, Electronics Div 268
Permattach Diamond Tool Co., Inc
Philadelphia Gear Works, Inc 139
Philadelphia Tramrail Co 310
Platt Bros. & Co., The
Plymouth Locomotive Works Div. of The Fate-Root-Heath Co 149
*Pope Machinery Corp 45
Portage Machine Co., The 119
*Potter & Johnston Co., Subsidiary of Pratt & Whitney Div., Niles-Bernent-Pond Co. Between Pages 144, 145
Pratt & Whitney, Div. Niles- Bement-Pond Co
Purdy Company, The 304

Industrial Equip. Co., Inc. 304 Seal Metals Co...... 274 *Republic Steel Corp.30, 31 Rhode Island Tool Co........... 296

(Continued on Page 310)

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ADVERTISERS IN THIS ISSUE

(Continued from Page 309)

Rockwell Engineering Co 304	United States Steel Export Co 255
Ruthman Machinery Co., The 273	*United States Steel Corp 255
	United States Steel Supply Div.,
	United States Steel Corp 255 Universal Ball Co
	Universal sall Co
S	
Sandusky Foundry & Machine Co. 236	
Sandvik Steel, Inc	¥
*Sciaky Bros., Inc.	
Between Pages 16, 17	*Vickers, IncBetween Pages 168, 169
*Selas Corp. of America 154	*Victor Equipment Co.
Service Foundry Div. of Avondale Marine Ways, Inc	Between Pages 250, 251 Virginia Gear & Machine Corp. 137
Sharon Steel Corp 6	virginia Gear & Machine Corp. 134
*Sheffield Corp 76	
*Sheldon Machine Co., Inc 252	
Share Instrument & Mfg. Co.,	
Inc., The	w
*Silent Hoist & Crane Co 272	
Snyder Tool & Engineering Co14, 15	Wagner Electric Corp 142
Springfield Mch. Teol Co114, 115	Wallack Bros304, 305
Standard Iron & Steel Co 395	*Wallingford Steel Co., The 262
Standard Oli Co. of Indiana26, 27	Warner & Swasey Co.
Standard Pressed Steel Co32, 33	Between Pages 48, 49
*Steel Products Engineering Co. 237	*Waterbury-Farrel Foundry & Ma- chine Co
Steelweld Div., The Cleveland Crane & Engineering Co 48	Webb Corp., The 266
Stone, R. J	Weirton Steel Co
Stueck, W. Whitney, Inc 308	Weiss, B. M., Co 354
Sun Shipbuilding & Dry Dock Co. M	Weiss Steel Co., Inc 306
	Wheelabrator Corp
	Wheeling Steel Corp.
	Between Pages 250, 251
	*Whiting Corporation Inside Front Cover
T	Wickwire Spencer Steel Div., The,
Tennessee Coal & Iron Div.,	Colorado Fuel & Iron Corp192, 193
United States Steel Corp 255	Wigglesworth Industrial Corp 302
*Thomas Flexible Coupling Co 269	*Wilkens Alwin FR. Inc 309
Timken Roller Bearing Co., The	Weed, R. D., Co
Back Cover	
*Tomkins-Johnson Co., The 260	
Trayer Products, Inc	
Trayer Products, Inc	
	CLASSIFIED SECTION
U	Business Opportunities 306
	Clearing House298-305
United Chromium, Div. Metal &	Contract Manufacturing Appears in first and third issue of each
Thermit Corp	month. See Aug. 4 & Aug. 18
United Engineering & Foundry CoBetween Pages 278, 27	Employment Exchange 306
U. S. Burks, Machine Tool Div 14	Equipment & Materials Wanted 306

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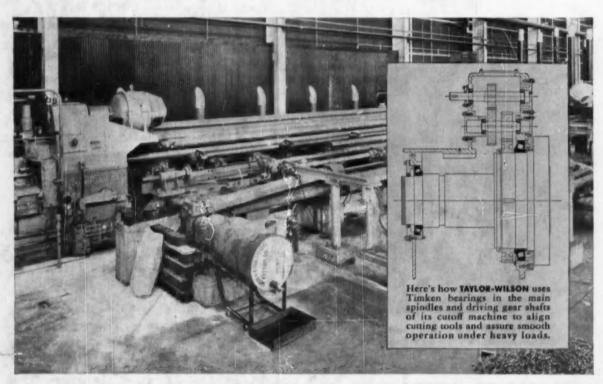
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